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ABSTRACT

Three hypotheses concerning the degree to which understanding of various conjunctions is related to reading comprehension were tested. Four instruments, two standardized tests and two designed for the experiment, were administered to a stratified sample of Mansfield, Ohio, fourth-grade students. The first hypothesis--that there is a significant relationship between ability to identify relationships that conjunctions signal and reading comprehension--was accepted on the basis of significant correlations on all measures. The second hypothesis--that there is a significant difference in the difficulty of various conjunctions--was supported through item analysis, binomial test, and chi-square indices of relative difficulty for various conjunctions. The third hypothesis--that significant differences in comprehension of conjunctions exist for boys and girls, for socioeconomic levels, and for intelligence levels--was also accepted. Among the implications of the study were the suggestions that more attention be given to teaching conjunctions and the relationships they signal and that more attention be given to the role of conjunctions in assessing the readability of materials. Tables and a bibliography are included. (MS)

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THE RELATIONSHIP BETWEEN UNDERSTANDING GRAMMATICAL CONJUNCTIONS AND READING COMPREHENSION

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TABLE OF CONTENTS

Chapter Page

I. UNDERSTANDING CONJUNCTIONS AND COMPREHENSIONS 1

II. THE DIMENSIONS OF COMPREHENSION 14

The Nature of Comprehension

Conjunctions

Syntax and Comprehension

III. DESIGN AND METHODOLOGY 55

Instrumentation

Population and Sample

Data Collection

IV. COLLECTION AND ANALYSIS OF DATA 78

Description of Data Collected

Description of Data of Analysis

V. SUMMARY AND CONCLUSIONS 104

Test Construction

The Collection and Treatment of Data

Findings and Conclusions

Implications for Practice and Research

BIBLIOGRAPHY 125

APPENDIX 134

LIST OF TABLES

Table Page

1. Davis Study Factors 25

2. Conjunctions 135

3. Vocabulary and Frequency of Usage 137

4. The Structure of an Individual Test Item 67

5. Reliability of Final Instrument 67

6. Significance of Difference-Cloze Test Passages 70

7. Subjects 73

8. Item Analysis 139

9. The Comprehension of Conjunctions Test-Distribution of Test Scores 140

10. Cloze Comprehension of Conjunctions Test-Distribution of Test Scores 141

11. The Pintner Mental Ability Test-Distribution of Test Scores 142

12. Stanford Reading Achievement Test-Distribution of Test Scores 143

13. The Comprehension of Conjunctions Test-Item Analysis . 144

14. Statistical Procedures 86

15. Partial Correlation-Hypothesis One 90

16. The Cloze Comprehension of Conjunctions Test-Hypothesis One 91

17. Hierarchy of Difficulty of Items Comprehension of Conjunctions Test 93

18. Hierarchy of Difficulty Among Difficult Items 96

19. Hierarchy of Difficulty Among Easy Items 97

20. Sex and Comprehension of Conjunctions 99

21. Socioeconomic Level and Comprehension of Conjunctions . 100

LIST OF TABLES (continued)

Table Page

22. Intelligence and Comprehension of Conjunctions 101

23. Summary of Results 110

CHAPTER I

UNDERSTANDING CONJUNCTIONS AND COMPREHENSION

Comprehension has been described as, "to grasp with the mind,"[1] "thinking,"[2] and "reading to interpret."[3] Factors that are thought to be related to comprehension range from understanding words, to thought units, to paragraphs, to total selection.[4] Among others, Ogden and Richards point out that words mean nothing by themselves. Only when a thinker makes use of them do they stand for anything or, in one sense, have meaning.[5] To understand meaning the reader must be able to read beyond the individual words to the relationships they signal.[6] The grammar of language helps to convey meaning. Word order, word form, and structure words enable the reader to identify individual sentence elements and to determine how the elements relate to each other. Lefevre says: "My basic assumption is that reading must be regarded as a language-related process; reading and the reaching of meaning must therefore be rigorously studied in relation to language."[7]

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[1] Emmett Albert Betts, "Research on Reading as a Thinking Process," Journal of Educational Research. (September, 1965), p. 1.

[2] Donald D. Durrell, Improving Reading Instruction. (Yonkers on Hudson: World Book, 1956), p. 10.

[3] James F. Kerfoot, "Problems and Research Considerations in Reading Comprehension." Reading Teacher. (January, 1956) p. 250-256.

[4] Ibid.

[5] Charles K. Ogden, and I. A. Richards, The Meaning of Meaning. (New York: Harcourt, Brace and World, Inc., 1952), p. 152.

[6] Sumner Ives, "Some Notes on Syntax and Meaning." Reading Teacher. (December, 1964), p. 179-183.

Although reading comprehension has been related to many factors little concrete evidence exists to guide reading instruction. Little is known about which abilities will enable the reader to comprehend. Teachers are unsure what affects it. College instructors have difficulty preparing teachers because their understanding is limited. Knowledge is needed about what a student who "understands" does as opposed to one who does "not understand." Until more adequate descriptions are evolved, there will be difficulty in guiding children.

Bormuth[8] found that many students never sufficiently master the skill of reading comprehension to the extent that permits them to acquire the knowledge contained in their instructional materials. This finding is attributed to the ineffectiveness of instruction in reading comprehension. Coleman[9] reports that school instruction has little influence upon children's acquisition of skills, such as reading comprehension.

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[7] Carl A. Lefevre, Linguistics and the Teaching of Reading. (New York: McGraw Hill Book, 1964), p. xii.

[8] John R. Bormuth, "The Effectiveness of Current Procedures for Teaching Reading Comprehension." A paper presented to the Annual Convention of the National Council of Teachers of English in Milwaukee, Wisconsin, November 29, 1968.

[9] J. S. Coleman et al. Equality of Educational Opportunity. (Washington D.C.: U.S. Government Printing Office, 1969.

Most first grade children learned to recognize words, according to The Cooperative Research Program in Primary Reading Instruction,[10] but the real deficiency was in understanding. Thus one of the most important aspects of reading remains largely a mystery.

Chomsky[11] believes that both the form and meaning of a sentence are determined by syntactic structures which are related to the sentence through interpretation. This factor lends the property of abstractness to grammatical structure. A language is defined by Chomsky as a set of semantic-phonetic percepts, of sound meaning correlations; the correlations being determined by the intervening syntactic structure. There are two aspects of syntactic structure. It consists of surface structure that underlies the semantic interpretation. Deep structure is an abstract representation in the mind which rarely is directly related to the phonetic signal.

Research indicates that children use structure words before they are able to relate meaning to the structures they are using. Piaget[12] found that children used connectives in their own language before they understood the corresponding meaning. Vygotsky[13] found evidence that children learn spoken language through imitation, and that they attach meanings to the structures they are using at a later time. This evidence corroborated Piaget's conclusions.

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[10] Robert Dykstra, "The Cooperative Research Program in Primary Reading." Reading Research Quarterly, (Fall, 1968).

[11] Noam Chomsky, "Language and the Mind." Psychology Today. (January, 1969), p. 48.

[12] J. Piaget, Judgment and Reasoning in the Child. (London: Routledge and Kegan Paul, 1928), p. 60.

[13] L. S. Vygotsky, Thought and Language. (Boston: Massachusetts Institute of Technology, 1940), p. 50.

Bereiter and Engleman[14] are concerned with the development of language as an instrument of learning and thinking in their preschool program. They point out that they do not care so much that a child learn nouns such as ball, but they make sure that their students can understand such words as _not_ and _or_, which they consider to be some of the most powerful logical tools in the language. Hurlock[15] points out that to perceive meanings the child must be able to see relationships. She also discusses the fact that children's ability to see cause and effect relationships develops gradually,and children under seven or eight years of age have inaccurate and incomplete concepts of causality.

The first words used by children are nouns, verbs appear second, then adjectives and adverbs appear after the age of one and one-half years. Prepositions and pronouns are the last major parts of speech to appear in the child's language. Nouns predominate in his speech until two years of age when he begins to use an increasing number of verbs, articles, conjunctions, prepositions, and pronouns.[16] The largest changes in frequency of use of all parts of speech, except adverbs, occurred between one and one-half and two and a half years as shown in studies by McCarthy[17] and Smith.[18] The percentages of pronouns, adjectives, verbs, prepositions, and conjunctions increased during this period while the percentage of nouns and interjections decreased.

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[14] Carl Bereiter, and Seigfried Engleman. _Teaching Disadvantaged Children in the Preschool._ (Englewood Cliffs, New Jersey: Prentice-Hall, 1966), p. 25.

[15] Elizabeth B. Hurlock. _Child Development._ (New York: McGraw-Hill Book Company, Inc., 1956), p. 370.

[16] Hurlock, _op. cit._, p. 187.

Stability in distribution of the parts of speech used by children seems to increase after three years of age. Templin[19] studied the percentages of various parts of speech used by subjects three to eight years of age with the following results; nouns 38 percent, verbs 26 percent, adjectives 12 percent, adverbs 7 percent, pronouns 6 percent, conjunctions 1.5 percent, prepositions 3 percent, interjections 3 percent, and miscellaneous 2 percent.

Apparently, conjunctions are among the parts of speech least used by young children. Understanding of these words develops somewhat later than use. However, conjunctions are considered sufficiently significant in reasoning by some authorities to warrant direct teaching of them.

Conjunctions are among the most common words in the English language. They are connectives which serve to join words, phrases, or sentences. Relationships within and between sentences are signaled by conjunctions.[20] Strang, McCullough, and Traxler[21] suggest that relationships assume importance when students encounter unfamiliar words or meanings. Conjunctions derive the major part of their meaning from the grammatical functions they indicate. The relationships of addition, contrast, explanation, consequence, and choice are developed by conjunctions.[22] The anticipated ending of the sentence in this example is changed by a conjunction: We were going to the fair, but our car wouldn't start so we stayed at home.

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[17] Dorthea A. McCarthy. "The Language Development of the Preschool Child." University of Minnesota Institute of Child Welfare Monograph, (1942), No. 4).

[18] M. E. Smith, "An Investigation of the Development of the Sentence and the Extent of Vocabulary in Young Children." University of Iowa Studies in Child Welfare, (1926), 3, No. 5).

[19] Mildred C. Templin, Certain Language Skills in Children. (Minneapolis: The University of Minnesota, 1957), pp. 102.

Robertson[23] studied pupils' understanding of connectives which include conjunctions in reading. She found a significant relationship between a child's understanding of connectives in reading and the factors of sex, mental age, listening, reading, and written language. A significant increase from grade to grade in the pupils' understanding of connectives was found in her study.

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[20] Edgar Schuster, Grammar, Usage, and Style. (New York: Webster Division of McGraw-Hill Book Company, 1965), p. 350.

[21] Ruth Strang, Constance M. McCullough, Arthur E. Traxler, The Improvement of Reading. (New York: McGraw-Hill Book Company, 1967), p. 303.

[22] Schuster, op. cit., p. 349.

[23] Jean A. Robertson, "Pupil Understanding of Connectives in Reading." Reading Research Quarterly. (Spring, 1968), pp. 387-415.

Card and McDavid[24] investigated the frequency of structure words, conjunctions are included in this class of words, in the writing of children and adults, and found that children use certain conjunctions frequently, while able adult writers use others. For example, an adult might choose as, or since, while children favor the one word, because. This suggests that mature, adult writers use conjunctions differently than younger less mature writers.

Bormuth[25] suggests that when comprehending, the reader sorts words into part of speech categories, which in turn determines phrase structure and semantic meaning. The meaning of words in sentences is modified by other words and phrases. When a word is classified as a part of speech, the operation of that word in the syntax of the sentence is determined; within the constraints of the category to which it is assigned. According to this theory, when a reader classifies a word as a conjunction he tends to interpret the word in terms of this classification when he encounters it in reading.

This study investigates the relationship between children's ability to understand conjunctions and reading comprehension. The relationship of comprehension and understanding conjunctions will be explored in order to develop a better understanding of both. This study focused on one member of the class of connectives, conjunctions.

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[24] William Card and Virginia McDavid, "Frequencies of Structure Words in the Writing of Children and Adults," Elementary English. (December, 1965), pp. 878-882.

[25] John R. Bormuth, "Teaching Sentence Comprehension," A paper presented at the Symposium on Reading as a Psycholinguistic Process, American Educational Research Association, February, 1967.

Robertson,[26] who concentrated on a broader class of connectives, which included conjunctions, selected her sample from a survey of three major reading series. Robertson related understanding of connectives to achievement. The developmental aspect of understanding connectives was also explored in her study, as she used subjects from fourth, fifth, and sixth grades. The connectives test designed for her study approached the problem of understanding connectives from a different point of view than the tests used in this study. Grammatical usage of connectives was emphasized in the Robertson study, while this study emphasized meaning of conjunctions. The Card and McDavid[27] study investigated connectives used in children's writing, while this study concentrated on the use of conjunctions in reading content.

The general objective of this study was to determine if an understanding of various conjunctions is related to reading comprehension. The following hypotheses are tested to accomplish this general objective:

1. There is a significant correlation between a subject's ability to identify the relationships that conjunctions signal and his reading comprehension.
2. There is a significant difference in the difficulty of various types of conjunctions, for example _and_ is easier to understand than _for_.

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[26] Robertson, _op_. _cit_., p. 392.

[27] Card and McDavid, _op_. _cit_., p. 878.

3. There is a significant relationship between understanding conjunctions and demographic variables of sex, socioeconomic level, and intelligence.
    - (a) Girls identify the relationships that conjunctions signal better than boys.
    - (b) Subjects from higher socioeconomic levels identify the relationships conjunctions signal better than students at low socioeconomic levels.
    - (c) Subjects with higher intelligence identify the relationships conjunctions signal better than subjects with lower intelligence.

The general design of this study included development of a multiple choice instrument which tested comprehension of conjunctions that signal the most commonly used relationships of addition, contrast, explanation, consequence, and choice. These conjunctions were selected through consulting major frequency or usage lists. A cloze test was developed as well, which included three passages; one with a high number of conjunctions, one with about half that number of conjunctions, and a passage with no conjunctions. In addition, two standardized tests were used, one to test reading achievement, and the other to measure mental maturity.

The sample for this study was composed of a stratified random sample of fourth grade students. The four instruments were administered to these subjects in order to collect data for analysis.

These definitions were developed for use in this study on the basis of the studies reviewed, which were basic references in the fields of reading comprehension, English grammar, and child development.

Understanding or comprehension was defined as the process in reading by which the reader derived meaning from the printed message on the paper.

Conjunctions are empty words, structure words. Conjunctions are connectives that serve to relate or join words, phrases and sentences.

A sentence in this study was defined as a word or group of words beginning with a capital letter and ending with a period, question mark, or exclamation mark.

A phrase is a group of two or more words. This group of words forms a syntactic unit which is read or spoken together.

The term syntax was used to discuss the ordering of words in a sentence.

Mental ability was the term used to describe the inherent think-capacity of the individual.

Achievement was defined as the knowledge acquired as a result of attending school.

Socioeconomic level was the term used to describe the social and cultural level of the students in the study as determined by the United States Government when designating schools as recipients of Title One E.S.E.A. assistance.

This study has implications for theory and practice. The outcomes of this study may provide for improvement of instruction. If there is indication that the relationships signaled by various conjunctions are difficult to comprehend, these relationships could become a focal point of instruction. Conjunctions which are difficult to comprehend could be introduced with instruction aimed at making them more comprehensible. Also, evidence regarding the role of conjunctions in reading comprehension may suggest which are important for the teacher to emphasize in oral reading instruction. Currently, teachers tend to correct all oral reading errors as if they were of equal importance; however, if some errors are more important than others, the teacher may safely ignore the less important errors. This policy of ignoring less significant errors may help the child's attitude toward reading which is often damaged by excessive criticism.

This study may provide direction for preparing instructional materials. Currently, five basic types of control are used in preparing reading materials: number of words, sound-letter associations, interest, literary, and structure of language. This study will help to determine those conjunctions which are difficult to understand so that they can be avoided in preparing instructional materials, or if they are used, special instruction may be provided to help the student. The conjunctions which are found to be easier to understand may be used freely in writing instructional materials. The findings may have implications for controlling readability level of materials. Currently, formulas for controlling readability measure the use of specific vocabulary words, length of sentences, and prepositional phrases. Control of the number and use of specific vocabulary words, length of sentences, and prepositional phrases. Control of the number and use of specific conjunctions as an index of readability may be indicated by the findings of this study.

The comprehension of disadvantaged students is a particular problem for teachers of reading. When answering questions disadvantaged children frequently respond with answers which appear to be unrelated to the questions asked. Teachers often assume that children are not paying attention. As the child moves through school this problem increases. A recent study directed by Marcus[28] brings new insight to this problem. He found that disadvantaged children heard each word, understood the meaning of each word, but focused on key words in the question which caused them to overlook the relationship of words within the question. They were unaware of syntactical structure and the use of conjunctions. Thus, this study may provide some direction for teaching disadvantaged children to comprehend reading content.

Further research may be an outgrowth of this study. The proposed study will further knowledge of the comprehension process which will suggest other areas of research that may be profitable for future study. For example, studies regarding the relationship between comprehension and other parts of speech may be found to be profitable. The instruments developed for this study may be used for studying evaluation of comprehension, which is a major problem of evaluation. A comparison of written and spoken use of conjunctions may be a profitable study since it is often assumed that they are the same. The relationship of conjunctions to surface structure and to deep structure would be a worthwhile study. Chomsky[29] says that "the syntactic component must generate deep and surface structures for each sentence, and must interrelate them." Since conjunctions are structure words which relate to both syntax and semantics this would seem a lucrative area of research.

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[28] "Why Can't They Understand," Reading Newsreport. Vol. III. (April, 1969), pp. 32-35.

Summary

On the basis of current knowledge regarding reading comprehension and conjunctions there exists a theoretical basis for exploring the relationship between these two variables. This relationship is explored in the current study through the use of four instruments designed to collect data regarding the variables cited. The relationships and the extent of the relationships were explored through the data derived from these sources.

The study is organized in the following manner: Chapter II presents the review of the literature; Chapter III presents information regarding test selection, test development, sample, population, and data collection; Chapter IV presents an analysis of the data, and Chapter V summarizes the study and discusses the conclusions.

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[29] Chomsky, op. cit., p. 49.

CHAPTER II

THE DIMENSIONS OF COMPREHENSION

Teacher concern for reading comprehension has grown from a point of little acknowledgment and little research to a point of major concern. In discussing the many faces of reading comprehension, Smith points out that "reading instruction had no comprehension face at all until about fifty years ago. The corpus of reading instruction up until 1915 to 1925 was that of teaching word recognition. When a child had learned to pronounce the words in reading, the teaching objective had been met."[1] The purpose of this chapter is to explore the area of comprehension, and to present brief reviews of research and literature related to the area. The related problem areas of conjunctions commonly used in English, as well as the role of syntax in reading comprehension, will be explored.

Comprehension

Reading Comprehension in History

The problem of reading comprehension has grown as the concept of reading instruction has grown. Smith[2] found in historical research that one of the early references to reading comprehension was used in the Webb Third Reader.[3] The use of the word in this situation indicated an increased attention to meaning in reading. Before 1900 when emphasis in reading was on the pronounciation of words, very little attention was paid to comprehension. In the Sixteenth Yearbook of the National Society for the Study of Education, Gray[4] used the term reading comprehension to denote the obtaining of meaning through reading. This concern for meaning is education multiplied during the early 1900's. Francis W. Parker gave expression to concern for understanding in the following quotation:

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[1] Nila Banton Smith. "The Many Faces of Reading Comprehension," The Reading Teacher. (December, 1969), 23, p. 253.

[2] Nila Banton Smith, American Reading Instruction. (Newark, Delaware: International Reading Association, 1962), p. 91.

> Many of the grossest errors in teaching reading spring from confounding the two processes of attention and expression. Reading itself is not expression any more than observation is hearing--language is expression.[5]

Huey writing in The Psychology and Pedagogy of Reading[6] also expressed concern for though getting rather than mere word saying in the reading process.

One of the major aims of the silent reading methods that was researched by Buswell was the development of comprehension. Buswell says:

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[3] Russell J. Webb, Webb's Normal Reader, No. 3 (New York: Sheldon, Lamport, and Blakeman, 1856).

[4] William S. Gray, The Relation of Silent Reading to Economy in Education. Sixteenth Yearbook, Part I, National Society for the Study of Education, (Bloomington, Illinois, Public School Publishing Company, 1917), p. 28.

[5] Francis W. Parker, Talks on Pedagogics. (Chicago: Kellopp, 1894), p. 93.

[6] Guy T. Buswell and William H. Wheeler. The Silent Reading Hour. (Chicago: Wheeler Publishing Co., 1923), p. 21.

> Silent reading is more than noiseless reading. Silent reading is not mere non-vocal reading. It is the complex process of getting thought from the printed page and involves an entirely new pedagogy.[7]

Thus researchers have sought understanding of reading comprehension for many years.

One of the early studies in this area was conducted by Huey. He used two articles of high interest, but moderate difficulty. The individual words from these articles were pasted on strips of cardboard and then exposed to readers for four seconds, after which the reader reported his associations with the word. Another facet of this experiment involved use of successive words and phrases pasted on cardboard slips. The subject again reported his associations after exposure to test materials. The two exposures were separated in time in order to prevent one test from interfering with the other. Huey concluded from this study that "meanings seemed usually to be felt as belonging to the larger wholes, to the sentences and other units. The words were mainly 'counters,' felt as having a part in the total, but their function being mainly to help tide one over to a place where a new meaning would be suggested or completed."[8]

Another early research study in comprehension was conducted by Thorndike.[9] He approached comprehension as a thinking process. He analyzed the errors made by elementary school children in answering simple questions based on short paragraphs. The subjects were allowed unlimited time and were allowed to refer to the paragraphs they had read. In analyzing his results he compared the reading process to solving a problem. He stressed the need for combining the diffused ideas into a related whole. Through this research it was demonstrated that instruction is required for getting meaning from the printed page. So, as early as 1917, Thorndike illustrated the complexity of reading comprehension.

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[7] Edmund Burke Huey, The Psychology and Pedagogy of Reading. (New York: The Macmillan Co., 1908), p. 359.

[8] Huey, op. cit., p. 158.

[9] E. L. Thorndike, "Reading as Reasoning: A Study of Mistakes in Paragraph Reading." Journal of Educational Psychology, (8, 1917), p. 323-32.

Factors Related to Reading Comprehension

A multiplicity of factors is involved in reading comprehension; this complexity is vividly illustrated in a review of reading research. Maw[10] related comprehension with curiosity. Jan-Tausch[11] related comprehension with concrete thinking when he found that concentration on concrete levels of thinking impeded comprehension. Piekarz[12] research supported the findings of Jan-Tausch as she found that the poor reader concentrated on literal meanings when reading. Fay, [13]

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[10] Ethel Maw, "Curiosity and Comprehension." The Reading Teacher, (16, January, 1962), p. 27.

[11] James Jan-Tausch, "Concrete Thinking as a Factor in Reading Comprehension," Challenge and Experiment in Reading. International Reading Association Proceedings, (New York: Scholastic Magazine, 1962), pp. 160-164.

[12] Josephine A. Piekarz, "Getting Meaning from Reading," Elementary School Journal. (March, 1965), pp. 303-309.

[13] Leo Fay, "The Relationship Between Specific Reading Skills and Selected Areas of Sixth Grade Achievement." Journal of Educational Research. 43, (1950), p. 541.

Shores,[14] and Artley[15] studied the specific comprehension factors related to each content area, and found that good readers used a greater variety of approaches than poor readers. The good readers were better able to choose an appropriate purpose for reading. Hilliard[16] studied the factors related to comprehension and found that intelligence, vocabulary, organization, and rate were most closely related to comprehension.

Theory of Reading Comprehension

Several authors and researchers have attempted to sort out the multitude of factors, those that appear to be validly related to reading comprehension. Some of this study has taken the form of analysis of the process, while other scholars have developed models of the process. Both the models and the research studies reveal a common factor, that reading comprehension is not a unitary skill.

Smith[17] suggested four models or categories of skills for comprehension which she considered broad enough to include all the thinking skills usually suggested by psychologists. She believes that these categories could be applied to any selection in any book. The categories developed by Smith are: (1) literal comprehension, which is the skill of getting direct literal meaning from the selection read, (2) interpretation, which covers all of the thinking skills (this category is concerned with meanings not stated in the content) (3) critical reading includes the previous two levels and goes beyond these to evaluate, pass judgment on the value and quality of the passage, (4) creative reading that grows out of the previous three categories. The reader goes beyond the author's ideas and develops his own.

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[14] Harlan J. Shores, "Skills Related to the Ability to Read History and Science." Journal of Educational Research. 36, (1943), pp. 181-188.

[15] Steryl Artley, "General and Specific Factors in Reading Comprehension." Journal of Experimental Education. 45, (1948), pp. 181-190.

[16] G. H. Hilliard. Probable Types of Differences Underlying Some Scores in Comprehension Tests, State University of Iowa Studies in Education, Vol. 2 no. 6 (Iowa City, Iowa: State University of Iowa, College of Education, 1924).

[17] Nila Banton Smith, op. cit., p. 249-259.

The categories developed by Smith are reminiscent of the reading model developed by Gray.[18] His model is based on perception, and then moves to the aspects of comprehension, reaction and assimilation. The comprehension aspect of this model includes literal meaning which is concerned with what the passages say, "securing expanded grasp of the meaning,"[19] and "understanding ideas read."[20] The third aspect of Gray's model is reaction which includes reacting to ideas acquired from reading. The fourth aspect of his model is fusion which involves seeing possible relationships between ideas read and previous experiences.

A somewhat different view of comprehension was proposed by Cleland[21] in his construct of reading comprehension, which explains the intellectual processes used by the reader. This model included: (1) perception which referred to seeing the reading content; (2) apperception, which referred to relating the new ideas read with the reader's experience; (3) abstraction which referred to the process of selecting specific meanings from generic meanings; (4) appraisal referred to the process of evaluating the meanings selected according to accepted standards; (5) ideation referred to using the ideas derived from the previous steps in thinking. Thinking in this situation involved inductive reasoning, deductive reasoning, critical thinking, problem solving, and creative thinking; (6) application is the functional use of ideas made by the reader. Several of the aspects expressed in this construct are found in the models proposed by Smith and Gray. Each of these models is based on perception, each involved seeing relationships, each involved reacting to what had been read, and each involved using what had been read.

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[18] William S. Gray, "The Major Aspects of Reading," in Sequential Development of Reading Abilities. Edited by Helen M. Robinson. (Chicago: University of Chicago Press, 1960), pp. 8-28.

[19] Gray, op. cit., p. 13.

[20] Gray, op. cit., p. 16.

[21] Donald L. Cleland, "A Construct of Comprehension," in Reading and Inquiry. International Reading Association Proceedings, (Newark, Delaware: Scholastic Magazines, 10, 1965), p. 249-259.

A very different model of reading is proposed by Holmes and Singer in the Substrata-Factor Theory.[22] Singer describes reading as, "an audio-visual processing skill of symbolic reasoning."[23] This theory relates ideas about the function of the brain to the reading process. A statistical procedure is used to specify the relationship of the results to certain tests of outcome measurement in reading. By calculating the relationships among test results the researchers attempt to determine the "subfactors" in reading. The term "power" of reading in this model involves ability to grasp main ideas and details, interpretation, and drawing inferences. Thus, there are some similarities between the Substrata Theory, and previously described models.

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[22] Jack A. Holmes, "Basic Assumptions Underlying the Substrata-Factor Theory." Reading Research Quarterly, (1, Fall, 1965), pp. 4-28.

[23] Robert Singer, Substrata-Factor Reorganization Accompanying Development of the Speed and Power of Reading at the Elementary School Level. Cooperative Research Project, No. 2100 (Washington D.C.: Office of Education, U.S. Department of HEW, 1965), p. 1.

Barrett[24] developed a taxonomy of reading comprehension skills, which is divided into five major skill categories: (1) literal comprehension; (2) reorganization; (3) appreciation. Within each of these major areas, Barrett has specified types of tasks involved. This taxonomy provides an interesting perspective for examining reading materials and teaching techniques.

Richards views meaning from a very different stance than many reading specialists. He discusses meaning from a more philosophical point of view and discusses meaning with particular reference to poetry. He points out that in literature, or any other mode of communication, there are several kinds of meaning which we must "juggle" for understanding. Richards believes that human utterances can be regarded from four points of view: (1) sense, refers to the purpose that the speaker has when he speaks; (2) feeling, refers to emotions or personal attitudes toward the subject; (3) tone, refers to the fact that the speaker ordinarily has an attitude toward his subject which is reflected in his choice and arrangement of words; (4) intention, refers to the conscious or unconscious aims of the speaker.[25] Thus, Richards' model is concerned with, "what he says (sense), his attitude to what he is talking about (feeling), and his attitude to his listener (tone), speakers (intention) his aim."[26]

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[24] Thomas C. Barrett, "Taxonomy of Cognitive and Affective Dimensions of Reading Comprehension," in Innovation and Change in Reading Instruction. Sixty Seventy Yearbook of the National Society for the Study of Education. (Chicago: University of Chicago Press, 1968), p. 19.

Each of the models, constructs, or taxonomies presented has provided a tool for examining the complicated task of reading comprehension, but each has weaknesses which may or may not be open to remedy. For example, each of the models presented has been limited because reading is an interrelated complex of skills which is almost impossible to convey in a model. Robinson says:

> Thus the mature reader can move flexibly from meaning to language, emphasizing one aspect or another of reading because he has thoroughly mastered each of the processes required to read in this manner. The skills in recognizing words and the attitude of constant search for meaning are automatic.[27]

Hidden influences on reading comprehension further complicate this already complex task. For example, experiential background of the reader is a significant aspect of the act of comprehension. As Deighton says, "meaning comes from experience."[28]

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[25] I. A. Richards, Practical Criticism. (A Study of Literary Judgment) (New York: Harcourt, Brace and Co., 1939), p. 180.

[26] Ibid.

[27] Helen M. Robinson, "Unity of the Reading Act," in Sequential Development of Reading Abilities. Supplementary ed. Monographs ed. by Helen M. Robinson, (Chicago: University of Chicago Press, 1960), p. 238.

[28] Lee C. Deighton, "Experience and Vocabulary Development" in Reading and Inquiry. Proceedings of the International Reading Association, (Newark, Delaware: International Reading Association, 1956), p. 56.

The dimensions of comprehension which have been presented are difficult to summarize because they are so diverse. However, it seems that many factors influence comprehension. There are also many points of view regarding comprehension, but there is agreement that it is a complex process composed of many factors.

The Nature of Comprehension

Berry[29] outlined the skills used by a good reader in her study of the comprehension errors made by college freshmen. She found that the good reader must read for general outline, facts, and content. He must be able to relate subordinate details to main ideas, select key sentences, visualize, note new or difficult terms and concepts, and grasp major issues and their implications. The good reader must understand individual words and infer the meanings of unknown words from context. He must be able to understand the writer's point of view and interpret the writer's intent. The good reader should follow a train of thought, ignore the irrelevant, be able to answer questions, isolate essential parts of an idea, note restrictive modifications, relate essential ideas or elements to each other, and relate parts of a reading selection to the whole. Berry concluded on the basis of experimental results that native intelligence and cultural background did not have to be considered in teaching students to improve comprehension skills.

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[29] Betty Trier Berry, "Improving Freshman Reading Habits." English Journal. 30, (1931), pp. 824-828.

Davis[30] conducted a factor-analytic study of comprehension, utilizing tests constructed to measure the skills considered of most importance by reading authorities. He surveyed the literature to determine the comprehension skills considered of greatest importance. A large list of skills developed from which he selected nine testable skills for further study; the nine skills selected were: recalling word meanings; drawing inferences about the meaning of a word from content; following the structure of a passage; formulating the main thought of a passage; finding answers to questions answered explicitly or merely in paraphrase in the content; weaving together ideas in the content; drawing inferences from the content; identifying the writer's techniques, literary devices, tone, and mood; and recognizing a writer's purpose, intent, and point of view. The skills are summarized in Table 1. The factors selected were used in an analysis of the reading comprehension tests of college freshmen. Results of this analysis show that the nine factors selected represent non-chance variance. The nine factors are summarized in Table 1.

Another study conducted by Davis[31] was designed to investigate eight of the nine skills previously isolated in his 1941 study. The subjects for this study were high school students who were administered multiple choice tests developed around the eight skills being investigated. This study indicates that "comprehension among mature readers is not a

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[30] F. B. Davis, "Fundamental Factors of Comprehension in Reading." Psychometrika, 9 (1944), pp. 185-197

[31] F. B. Davis, "Reasoning in Comprehension in Reading." Reading Research Quarterly. (Summer, 1968), pp. 501-545.

TABLE I

DAVIS STUDY FACTORS

Skill	No. of Items	Mean	Variance
1. Recalling word meanings	60	23.77	134.70
2. Drawing inferences about the meaning of a word from content	20	13.70	10.56
3. Following the structure of a passage	9	4.20	3.01
4. Formulating the main thought of a passage	5	2.97	1.22
5. Finding answers to questions answered explicitly or merely in paraphrase in the content	22	18.10	6.05
6. Weaving together ideas in the content	42	25.67	32.17
7. Drawing inferences from the content	43	28.46	33.75
8. Identifying a writer's techniques, literary devices, tone, and mood	10	6.75	3.46
9. Recognizing a writer's purpose, intent and point of view	27	15.19	16.55

unitary mental skill or operation."[32] On the basis of this research Davis suggests that systematic and carefully planned learning exercises that are appropriate in difficulty for each pupil should be provided throughout the secondary school grades.[33]

Hunt[34] investigated the different skills comprising reading comprehension through a differential item analysis of 204 multiple-choice items used by Davis in the Cooperative Reading Comprehension Tests. The items were classified with respect to six skills by twenty-one judges. The subjects in his study were 370 high school students. He found that comprehension in reading involves word knowledge and paragraph comprehension. In his 1968 study Davis found that word knowledge and reasoning in reading account for virtually all of the variance of comprehension, so the two studies are in agreement.

Harris[35] examined the skills related to comprehension of literature with young adult males. He used objective items to measure seven comprehension skills. Following is a list of the skills studied:

1. Recognizing synonyms for unusual words or groups of words.
2. Recognizing equivalents of words or groups of words as used in context.

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[32] Davis, op. cit., p. 543.

[33] Ibid.

[34] L. C. Hunt Jr. "Can We Measure Specific Factors Associated with Reading Comprehension?" Journal of Educational Research, 51, (1957), pp. 161-171.

[35] C. W. Harris, "Measurement of Comprehension in Literature." The School Review. 56, (1948), pp. 280-289; 332-342.

3. Recognizing pronoun antecedents, subjects, and predicates, in loosely organized sentences, inverted sentences, or sentences with unusual order.
4. Recognizing main ideas, subordinate ideas, summaries of ideas, implied ideas.
5. Recognizing summaries of characteristics, actions, motives, and attitudes described in the passage.
6. Recognizing the relationship between technique and meaning.
7. Recognizing the writer's attitude toward subject and characters etc. His mood, emotion, intents, and purpose.

On the basis of his investigation of these skills, Harris suggests that different types of written material should be used to test different skills.

Artley[36] studied the relationship between reading comprehension and comprehension in social studies. This investigation involved measurement of reading comprehension and social studies skills with five standardized tests. The results of the five tests were correlated to determine relationships between reading comprehension and comprehension of social studies material. The subjects in this investigation were eleventh grade students. He found a substantial relationship between general reading ability and ability to do certain types of thinking in the social studies. However, the correlation of .79 indicates that there is substantial specificity for some of the types of thinking related to social studies.

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[36] Artley, op. cit., p. 187.

Maney[37] and Sochor[38] utilized item analysis in their studies of science and social studies materials. They constructed and evaluated intermediate grade reading tests in these content areas. Fifth grade students were subjects in both studies. Maney and Sochor concluded there was a positive, but low, relationship between literal reading ability and critical thinking. This leads to the conclusion that there is a difference in the types of thinking required by different reading situations." Betts[39] combined the studies of Artley, Sochor, and Maney into a fourth study called, "Research in Reading as a Thinking Process." He concluded among other things that "Reading is a complex of mental abilities embracing with other elements clusters of specific skills, abilities, and attitudes."[40]

Schoeller[41] critically examined the scientific studies on reading comprehension and drew conclusions regarding the nature of reading comprehension. His analysis consisted of five dimensions of reading comprehension: (1) nature of comprehension; (2) psychology of reading comprehension; (3) relationship between concepts and comprehension; (4) factors in the reader which determine extent of comprehension and; (5) factors not related to comprehension. He noted that two large components and three small components of comprehension have been identified by factorial analysis; reasoning in reading or a verbal factor, which is largely dependent of intelligence, has shown to be the largest component of comprehension. The second largest component has been identified as word knowledge, or a word factor. Three small components were identified as (1) seeing relationships which may be related to reasoning, but which seems to be a specific ability; (2) drawing inferences from facts presented; (3) organizing specific factors.

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[37] Ethel Wain Mane, Literal and Critical Reading in Science. Doctor's Dissertation. (Philadelphia 22, Pennsylvania: Temple University, 1952.)

[38] E. Elona Sochor, Literal and Critical Reading in Social Studies. Doctor's Dissertation, (Philadelphia 22, Pennsylvania: Temple University, 1952).

[39] Emmett Albert Betts, op. cit., pp. 1-13.

[40] Betts, op. cit., p. 12.

[41] Arthur W. Schoeller, A Critical Survey of the Scientific Studies of Reading Comprehension. Unpublished doctoral dissertation. (Pittsburgh: University of Pittsburgh, 1950), pp. 192-203.

Sex differences in reading comprehension were the objective of research in at least two studies. Stroud and Lindquist[42] studied 50,000 pupils in grades three through eight. They used data compiled from administration of the Iowa Every-Pupil Basic Skills Test. They found that girls were consistently and significantly superior to boys in reading comprehension. The greatest difference between boys and girls was found in grades two through six. Alden *et al.*[43] studied 6,000 children in grades two through six using the Durrell Sullivan Reading Capacity Test. They found that the number of boys who were one or more years retarded in reading comprehension was double that of girls in each of the first five grades.

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[42] J. B. Stroud and E. F. Lindquist, "Sex Differences in Achievement in the Elementary and Secondary School," *Journal of Educational Psychology*. 33, (1943), pp. 657-667.

[43] Clara Alden, Helen B. Sullivan, and Donald Durrell, "The Frequency of Special Reading Disabilities," *Education*, 42, (1942), pp. 32-36.

The studies summarized here confirm the complex nature of reading comprehension. Research indicates that a number of skills appear to be involved in comprehension. Research also confirms that instruction in reading comprehension is useful in improving comprehension. Research suggests that boys have more difficulty comprehending than girls.

Improvement of Comprehension

Carroll[44] studied comprehension in relationship to reading directions. His purpose was to determine whether reading of directions could be improved by specific practice. Although this study was conducted in 1926, concern for reading directions continues to be a common problem today, both in school and out of school. Direction reading requires very exact reading which is apparently difficult for many readers. Carroll used drill with seventh and eighth grade students and found that drill in reading directions produced marked improvement in this type of reading. "In the three experiments, the four groups that were given practice made an average gain of 60.24 percent in the function trained."[45]

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[44] Robert P. Carroll, An Experimental Study of Comprehension in Reading. (New York: Bureau of Publications Teachers College, Columbia University, 1926), p. 51.

[45] Carroll, op. cit., p. 61.

Improving comprehension ability was the goal of Alderman also. He studied "Improving Comprehension Ability in Silent Reading."[46] His subjects were students in grade four through eight. The experimental group was drilled with exercises on organization, retention, and vocabulary while the control group continued in the usual fashion. The students using the drills made more progress in every area; however, organization drill was of the most value, retention next,and vocabulary of least value. Children who scored low in comprehension ability profited more from this type of drill than those in the upper quartile.

Purposing is widely recognized as a key to reading comprehension.[47] Many authors suggest the use of specific purposes for improvement of comprehension. Smith[48] studied the various purposes listed by different researchers and developed a list of twelve for further study. She then developed exercises and tests to use with high school students. The outcomes of this research indicated that the purposes in her list were related to reading comprehension; further, her study reestablished that these purposes could be developed through instruction. The purposes established through her study were as follows:

1. general impression
2. main ideas
3. details
4. sequence

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[46] G. H. Alderman, "Improving Comprehension in Reading." Journal of Educational Research. 13, (1926), pp. 11-21.

[47] Kerfoot, op. cit., p. 255.

[48] Helen K. Smith. Instruction of High School Students in Reading for Different Purposes. (Chicago: The University of Chicago, 1966), p. 13.

5. comparison
6. cause and effect
7. sensory imagery
8. characterization
9. anticipate outcomes
10. mood
11. fact or opinion
12. directions

"Relationship Between Interest and Reading Comprehension," was the study conducted by Bernstein.[49] The purpose of this study was to determine whether a student's comprehension was better when he was reading an article that was interesting than when reading a selection which was uninteresting. The researcher was also interested in determining what ways interest is related to reading comprehension. Two stories were written for this study, one was written in an interesting manner; while the second story was written in a dull manner. The outcome of this study was that students who are reading a selection which is more interesting than another do read with superior comprehension. Higher interest was also reflected in a fuller more adequate written response. "Higher interest also seemed to evoke more creative responses; responses that showed the pupils were reading actively and thinking about the materials as they went along."[50]

In a recent investigation of reading comprehension, Bormuth[51] utilized the cloze procedure to determine student ability to comprehend at different levels: primary, intermediate, junior high, and senior high school levels. He found that in the fourth grade, "a great many of the children were unable to exhibit comprehension of even the simplest structures by which language signals information."[52] Bormuth found that there was no clear concept of comprehension skills reflected in either materials used to teach comprehension or in textbooks used to instruct teachers regarding comprehension.

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[49] Margery R. Bernstein, "Relationship Between Interest and Reading Comprehension," Journal of Educational Research. (December, 1955), p. 288.

[50] Ibid.

[51] Bormuth, op. cit., "The Effectiveness of Current Procedures for Teaching Reading Comprehension." p. 5.

Wolf, King, and Huck[53] studied teaching of critical reading which is an aspect of comprehension. Their purpose was to investigate whether critical reading skills could be taught to children in grades one through six while maintaining basic reading skills. They also studied the relationship between certain factors and critical reading ability; and the kinds of teacher verbal behavior which elicited critical responses from children. The results of this study show that the experimental groups which received instruction in critical reading received significantly higher total critical reading scores than the control groups. At no grade level was there a significant difference between the scores of the two groups on general reading ability. General reading ability and intelligence were found to be related to critical reading ability. The teachers' interpreting, analyzing, and evaluating questions produced more critical responses from children than other types of questions.

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[52] Ibid.

[53] Willavene Wolf, Martha L. King, and Charlotte S. Huck. "Teaching Critical Reading to Elementary School Children." Reading Research Quarterly. (Summer, 1968).

A modern attitude toward reading was reflected in a recent study entitled, "Cybernetic Control of Memory While Reading Connected Discourse."[54] This study presented a model of reading that suggested that the reader enters a "minimal set of stimuli into memory, which govern subsequent feedback control, and that Ss allow passage organization to act as a surrogate storage for easily retrieved verbal units."[55] The college students read materials which were organized by concept name and materials organized by attribute. The group which read the materials organized by concept name retained more attributes than the group which read the same materials organized by attribute.

The data presented here regarding reading comprehension indicated that comprehension is a multi-faceted ability. The studies cited show that comprehension is influenced by factors such as sex, intelligence, interest, and organization of content. Certain of the studies show that comprehension skill can be improved through instruction.

Certain words express the great thoughts of mankind; these words are nouns, adjectives, and verbs. These are the substantive words of language. However, the full meaning of these substantive words depends upon another class of words, the thought connectors, that indicate relation; these "thought-connectors are prepositions, conjunctions, relative pronouns, and adverbs."[56] Fernald suggests that, "the value of these connectors may be clearly manifested by simply striking them out of any well-known paragraph and showing the barrenness and confusion that result."[57] For example, the connectives have been eliminated from the "Pledge of Allegiance to the Flag of the United States of America" in the following passage.

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[54] Lawrence T. Frase, "Cybernetic Control of Memory While Reading Connected Discourse." Journal of Educational Psychology. 60, (1968), pp. 49-55.

[55] Frase, op. cit., p. 49.

[56] James C. Fernald, Connectives of English Speech. (New York: Funk and Wagnalls Company, 1904), p. 1.

> I pledge allegiance ______ the flag ______ the
> United States ______ America, ______ ______ the
> Republic ______ ______ it stands, one nation ______
> God, indivisible, ______ liberty ______ justice
> ______ all.

Conjunctions as a class of words were recognized by Aristotle. He investigated the parts of speech, distinguishing nouns, verbs, and a third conglomerate class called conjunctions.[58] Coleridge is credited with saying "that good writers could be known by their use of connectives--but, yet, though, because, since, and the like. Closely reasoned prose,"he said, "had a linked strain throughout, but the sentences of inferior authors like marbles in a bag, touched without adhering."[59]

Conjunctions were unnecessary in Old English because it was an inflected language,[60] and like all inflected languages, the relation of words in a sentence was indicated largely by means of inflections. During the Middle English Period (1100-1500) inflections in English disappeared in many cases. This factor caused English to become an analytic language which makes use of fixed order of words and connectives to indicate relationships. Thus conjunctions became more important in the English Language.

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[57] Ibid.

[58] John T. Waterman, Perspectives in Linguistics. (Chicago: The University of Chicago Press, 1963), p. 7.

[59] R. A. Philbrick. Understanding English. (New York: The Macmillan Company, 1944),p. 16.

[60] Albert C. Baugh, A History of the English Language. (New York: Appleton-Century-Crofts, Inc. 1957), p. 63.

Acquisition of Conjunctions

Apparently children acquire the use of conjunctions somewhat later than the use of substantive words such as nouns and verbs. Ervin and Miller[61] point out that "function words are almost completely lacking in the early stages of development." Children use noun phrases at early levels of acquiring grammar; these phrases are pivotal in nature (a noun and a pivot word are used) for example, a phrase like "go ball" might be used by a twenty month old child.[62] The child's grammar at this stage consists of words in pivot classes and words in open classes. Children apparently use these original classes as a tool for differentiating the various classes of words. The open class develops into conjunctions, prepositions, adverbs, and determiners. Velten[63] found that his daughter developed the use of prepositions, demonstratives, auxiliaries, articles, conjunctions, possessives, and personal pronouns, the past tense suffix, the plural suffix, and the possessive suffix between 27 and 30 months of age.

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[61] W. Miller and Ervin S. "The Development of Grammar in Child Language," in The Acquisition of Language. U. Bellugi and R. Brown (eds.) Monographs of Society in Research in Child Development. 1964, 29, 1, 9-34.

[62] R. Brown and Fraser C. "The Acquisition of Syntax," in Verbal Behavior and Learning. C. N. Cofer and B. S. Musgrace (eds.) (New York: McGraw-Hill, 1963.

Young[64] studied the frequency of parts of speech used by children ages 30 to 48 months from average and below average socioeconomic status. Pronouns and verbs were most common, each comprising about 26 percent of all words used. Nouns were next in frequency, 17 percent and were followed by adverbs, 10 percent; adjectives, 7 percent; prepositions, 4 percent; infinitives and interjections, 3 percent each; and conjunctions 1.5 percent.

McCarthy[65] and Smith[66] found that the largest changes in frequency of use of all parts of speech except adverbs occurred between one and a half years and three years. The percentages of pronouns, adjectives, verbs, and prepositions, and conjunctions increased during the period while the percentage of nouns and interjections decreased.

Stability in the distribution of parts of speech used by children seemed to increase after three years of age. McCarthy[67] studied the different parts of speech used by children after three years of age with the following results: the percentage of nouns stabilized near 20 percent, verbs around 25 percent, adjectives around 15 percent, adverbs around 7 percent, pronouns around 20 percent, conjunctions around 4 percent, prepositions around 7 percent, interjections around 1 percent, and miscellaneous less than 1 percent. Templin[68] studied the percentages of various parts of speech used by subjects three to eight years of age with the following results: nouns 38 percent, verbs 26 percent, adjectives 12 percent, adverbs 7 percent, pronouns 6 percent, conjunctions 1.5 percent, prepositions 3 percent, interjections 3 percent, and miscellaneous 2 percent.

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[63] H. V. Velten, "The Growth of Phonemic and Lexical Patterns in Infant Language." *Language*. X (1943), pp. 190-204.

[64] F. M. Young "An Analysis of Certain Variables in Developmental Study of Language." Genetic Psychology Monographs. 23, (1941), pp. 3-141.

[65] Dorothea McCarthy, *op. cit.*, p. 60.

[66] M. E. Smith, *op. cit.*, p. 60.

[67] *Ibid.*

Thus, it appears that children acquire conjunctions somewhat later than other parts of speech. Also, young children appear to use fewer conjunctions in their oral language than other parts of speech.

Psychological Nature of Conjunctions

Chomsky[69] suggests that both the form and meaning of a sentence are determined by syntactic structures that are related to the sentence through interpretation. This factor lends the property of abstractness to grammatical structure. A language, is defined by Chomsky as a set of semantic-phonetic percepts, of sound meaning correlations; the correlations being determined by the intervening syntactic structure.

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[68] Mildred C. Templin, _op. cit._, p. 102.

[69] Noam Chomsky, _op. cit._, p. 48.

Syntactic structure consists of two factors. It consists of surface structure which is directly related to the phonetic form; and deep structure that underlies the semantic interpretation. Deep structure is an abstract representation which is not usually directly related to the phonetic signal.

Terwilliger[70] described function words (conjunctions are a member of this class of words) as words which are defined by the roles which they play in sentences, and by the roles which they play in relating words to each other. He believes that a function word is a precise entity in a way in which form class words are not. The meaning of a form class word can be deduced from the contexts in which it is used, while function words cannot be deduced from context. The meanings or functions of function words must be learned precisely and individually. Terwilliger suggests that the specific environmental situations and precise grammatical uses of function words must be learned by rote memorization. He believes that no deviation is permitted in the usage of function words; although, deviation is permitted in the usage of form class words. The specialized nature of function words causes them to be harder to learn to enter the child's vocabulary later and to be used more incorrectly than the form class words.

Research indicates that children use structure words before they are able to relate meaning to them. Piaget[71] found that children used connectives in their own language before they understood the corresponding meaning. Vygotsky[72] found evidence that children learn spoken language through imitation, and that they attach meanings to the structures they are using at a later time. This evidence corroborated Piaget's conclusions.

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[70] Robert F. Terwilliger. Meaning and Mind. (New York: Oxford University Press, 1968), pp. 43-44.

[71] Piaget, *op. cit.*, p. 60.

The development of language as an instrument of learning and thinking is the goal of Bereiter and Engleman[73] in their preschool program. They point out that they do not care so much that child learn nouns such as ball, but they make sure that their students can understand such words as not and or, which they consider to be some of the most powerful logical tools in the language. Hurlock[74] points out that to perceive meanings the child must be able to see relationships. She believes that the child's ability to see cause and effect relationships develops gradually, and children under seven or eight years of age have inaccurate and incomplete concepts of causality.

Definitions of Conjunctions

Conjunctions are members of a class of words that have grammatical meaning. These words are empty words, words which merely indicate the grammatical relations of words; they stand for nothing ever found in the practical world. "A word having only grammatical meaning is an empty word, i.e., a word empty of practical meaning. The systematic use of empty words is the second main device of English grammatical structure--surpassed in importance only by fixed word order."[75]

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[72] Vygotsky, op. cit., p. 50.

[73] Bereiter and Engleman, op. cit., p. 25.

[74] Hurlock, op. cit., p. 187.

Conjunctions are also called structure words. Roberts[76] points out three ways in which structure words are different from the form classes. Structure groups are small groups of words, while form groups number in the thousands. A second difference is that structure words have no features of form to mark them in sentences. Words in form classes may be marked by features like plural endings or tense endings, or suffixes, and prefixes. A third difference is that structure words come into play mostly when these basic patterns are expanded.

Numerous definitions for conjunctions can be found. Fernald[77] refers to them as, "the simplest of connectives, merely conjoining or joining words, phrases, or sentences." Fries[78] defines conjunction as "a word that joins together the sentence or parts of a sentence." He also states that conjunctions are also words whose chief meanings lie in the grammatical functions they indicate."[79] Long[80] defines conjunctions as a syntactically miscellaneous category composed of: (1) the basic coordinators, and, but, or, and not, and the precoordinators, both, not, either and neither; (2) clause marker adverbs such as when, how, and if; (3) prepositions such as after and because; and (4) the clause marker that.

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[75] Harold Whitehall, The Structural Essentials of Written English. (Bloomington, Indiana: Indiana University, 1951, second edition), p. 29.

[76] Paul Roberts, Patterns of English, (New York: Harcourt, Brace, and World, 1956), p. 293.

[77] Fernald, op. cit., p. 195.

[78] Charles Carpenter Fries, American English Grammar. New York: Funk and Wagnalls Company, 1944), p. 195.

[79] Ibid.

[80] Ralph B. Long, The Sentence and Its Parts. (Chicago: The University of Chicago Press, 1961), p. 484.

Roberts[81] defines conjunctions as "words that pattern like and." He also points out that conjunctions sometimes connect whole patterns. Hill[82] believes that conjunctions can only be fully understood in terms of complex sentences. He states that "conjunctions are one of the classes of invariant words--that is, they take no suffixes and prebases and no postbases. They do, however, admit compounding." Strang[83] defines conjunctions as joining words, and names the two types of conjunctions as coordinators, and subordinators. Whitehall defines conjunctions in the following quotation:

> conjunctions are connective empty words used to link words or word groups in non-base relationships ......the only class used to establish direct connection between subjective-predicate word groups.[84]

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[81] Roberts, op. cit., p. 295.

[82] Archibald A. Hill, Introduction to Linguistic Structures. (New York: Harcourt, Brace, and Company, 1958), p. 398.

[83] Barbara M. Strang. Modern English Structure. (New York: St. Martins Press, 1965), p. 173.

[84] Harold Whitehall, Structural Essentials of English. (New York: Harcourt, Brace, and Company, 1956), p. 90.

Flesch says "that connectives tell the reader exactly in what way the ideas are tied together."[85]

Summary

In examining the numerous definitions of conjunctions one finds that conjunctions are words that join words, phrases, and sentences. Conjunctions derive their meaning from the functions they signal in the sentence; in fact they are termed function words by some authors, connectives by others, and empty words by others.

Conjunctions and Reading

The significance of conjunctions for reading comprehension is made apparent in this quotation by Whitehall:

> A word having only grammatical meaning is an empty word . . . The systematic use of empty words, the third main device of English grammatical structure, is surpassed only in importance by fixed word order. Essentially, empty words provide a grammatical framework within which the meanings of the full words operate.[86]

Other authors have drawn attention to the role of connectives in reading. Thorndike[87] found that although pupils understood the meaning of words in paragraphs they continued to make errors in answering questions regarding the paragraph. After studying the nature of these errors he concluded that pupils were not able to use relational words and phrases, such as _but_ and _on the contrary_, to relate ideas with each other. When the reader did not understand these relationships he assigned over-potent meaning to certain words and under-potent meaning to other words.

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[85] Rudolf Flesch, A New Guide to Better Writing. (New York: Popular Library, 1963), p. 56.

[86] Whitehall, op. cit., p. 90.

[87] E. L. Thorndike, "The Understanding of Sentences," Elementary School Journal. 18, (1917), pp. 98-114.

Huey[88] studied the ideas and images aroused by various words, among the words he studied were connective and relational words. He found that these "little words," as they were labeled by his subjects, suggested almost no imagery and seldom aroused any ideas directly. The few associations suggested by these words were verbal, and usually were phrases of which they were ordinarily a part. However, these words did give evidence of setting the readers' thoughts in some characteristic direction of expectancy.

Weaver's[89] experiments with cloze techniques indicated that subjects made a greater volume of responses for words determined by structural pattern or syntactic constraint. He also found that structural meaning was conveyed better by silent reading than by listening, while lexical meaning was conveyed equally well by either medium. He further suggested that structural elements were probably stored in a fashion to function as cues for the mass of stored substantive or semantic words.

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[88] Huey, _op. cit._, p. 154.

[89] W. W. Weaver, "Theoretical Aspects of the Cloze Procedure," in _The Philosophical and Sociological Bases of Reading_. ed. Eric L. Thurston and Lawrence E. Hafner. (Fourteenth Yearbook of the National Reading Conference). (Milwaukee: National Reading Conference, Inc. 1965), pp. 115-132.

He hypothesized that, "stored high frequency structural words are matched to the language imput in decoding and used again in generating or encoding the responses as drawn from the large storage bank of such terms and tend to be determined by the structural constraints."[90] This interpretation is supported by the evidence that function words offered in recall of such materials as a story tend to be similar to the individual's own spontaneous production while the lexical elements agreed very closely with those in the original materials, conforming to the semantic constraints in the content.

Squire[91] suggests that research is needed to develop a better understanding of connectives. He believes that it is not enough to use a word such as "although" due to the subtleties involved in the relationship signaled by the word. He says, "How then can we help fourth graders to manipulate the 'although' relationship? When do children begin to use and understand 'if . . . then' and similar relationships? The possibilities for important research in this field seem endless."[92]

Robertson[93] studied pupils' understanding of connectives in fourth, fifth, and sixth grade levels. She designed instruments for measuring understanding of connectives to use in the study. A significant relationship between a child's understanding of connectives in reading and the factors of sex, mental age, listening, reading and written language, were found in this study. She also found that there was a significant increase from grade to grade in pupil understanding of connectives and the types of errors he made when reading.

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[90] Weaver, op. cit., p. 125.

[91] James R. Squire, "Multilevel Research in English," in Needed Research in the Teaching of English, edited by Erwin R. Steinberg (Carnegie Institute of Technology, 1962), p. 25.

[92] Ibid.

[93] Robertson, op. cit., p. 414.

Card and McDavid[94] investigated "the frequency of structure words in the writing of children and adults, "through comparison and contrast of vocabulary lists. The vocabulary lists represented both children's writing and adult writing. They found that children used certain conjunctions more frequently, while the able adult writers used others. For example, the adult might choose _because_, _as_, _since_, or _and_, while children favor the one word, _because_.[95]

The above findings are similar to those of Loban[96] who conducted a longitudinal study of elementary school children. He studied both the oral and written language of elementary school children. He found that the high group used subordination to a greater extent than the average and low groups when measured with an index of subordination. He noted the use of subordinating connectors increased with chronological age, mental ability, and socioeconomic status.

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[94] Card and McDavid, _op. cit._, pp. 878-882.

[95] _Ibid._

[96] Walter D. Loban, _The Language of Elementary School Children._ (Champaign, Illinois: National Council of Teachers of English, 1963), p. 86.

Harrell[97] studied the oral and written language of children from eight to twelve years of age through analysis of samples of oral and written language. Davis[98] studied the linguistic development of children from five to ten years through analysis of their oral language. The outcomes of both these studies indicated that children from eight to twelve used subordination in their written and oral language in from ten to thirty percent of all the sentences they used. They also found that the amount of subordination increased with age.

Conjunctions are empty, structure words that enter the grammar of children somewhat later than full or substantive words. Conjunctions derive their meaning largely from the functions they fulfill within and between sentences. This function is largely one of indicating relationships. A limited amount of research is available regarding conjunctions; however, the available research indicates the possibility of a relationship between reading achievement and understanding of conjunctions.

Syntax and Comprehension

Recognizing words is not reading. Reading is understanding what the sentences say. Ives states, "that a method of teaching reading which stops with the recognition of words is relying on the pupils to assemble the matrix from the words and to understand the contribution it makes to the meanings and relationships of the words. It assumes that the pupils have acquired the ability to supply the proper grammatical components of meaning as they have learned to speak the language.[99] Considering the importance which is placed on comprehension in reading it is amazing that we have overlooked the fact that reading is primarily a linguistic process, and, because this is true, that phonology, morphology and syntax are significant aspects of the process. Since reading is concerned with meaning, the reader must recognize how meaning is expressed in the English language because children are taught to read English not to read in the abstract.

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[97] L. E. Harrell Jr. A Comparison of the Development of Oral and Written Language in School-age Children." Monograph of the Society for Research in Child Development, 22 (1957), pp. 63-71.

[98] Edith A. Davis, The Development of Linguistic Skills in Twins, Singletons with Siblings, and only Children from Age Five to Ten Years. (Minneapolis: University of Minnesota Press, 1937.)

Understanding meaning in reading is really dealing with the problems of sharing meaning through language. Fries says that, "all the meanings stored in language are communicated by the sets of language skills that constitute a language code."[100] Bormuth states that, "comprehension is not just a set of mental processes which can be defined independent of language, and instruction must be systematically designed to assure that children learn those systems by which language signals meaning."[101] Goodman believes that "reading is a psycholinguistic process. It involves the interaction of language and thought as language is decoded and meaning reconstructed."[102] He also states that, "to understand the process of reading we must understand how the linguistic code words as a carrier of meaning and we must understand how the reader uses language in comprehending; the study of language and language use is at the heart of the study of reading."[103]

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[99] Ives, op. cit., p. 128.

[100] Charles Carpenter Fries, Linguistics and Reading. (New York: Holt, Rinehart, and Winston, Inc., 1963), p. 132.

[101] John R. Bormuth, "An Operational Definition of Comprehension Instruction," in Psycholinguistics and the Teaching of Reading. ed. by Kenneth S. Goodman and James T. Fleming, (Newark, Delaware: The International Reading Association, 1968), p. 48.

Syntax is especially significant in English because meaning is not conveyed one word at a time, additively. In synthetic language such as Latin the meaning of a word is indicated by the inflection attached to the end of the word which indicates gender, number, and case. The order of words in a synthetic language is not so significant as it is in an analytic language like English. In English, the particular meaning of the opening words in a sentence depends upon the context of the entire sentence; thus, it is only at the end of the sentence that the reader can fix the meanings of the individual words. The formal distinction between runs as a noun and runs as a verb is syntactic. "How many runs did he have today?" "Linda runs very fast." "There are two runs in my hose." The situation becomes even more complicated when a word remains a verb, but the syntax of the sentence gives the verb various forms such as the verb grew in the following sentences. "The boy grew fast." "The boy grew tall." and "The boy grew roses." The meaning of grew in the first sentence is intransitive, in the second linking; and in the third transitive. These examples make evident the importance of syntax in English. Hill states that "significant sentence element order is probably responsible for the often repeated statement that English is a language primarily characterized by word order."[104]

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[102] Kenneth S. Goodman, "Words and Morphemes in Reading," in Psycholinguistics and the Teaching of Reading. ed. Kenneth S. Goodman and James T. Fleming, (Newark, Delaware: The International Reading Association, 1968), p. 25.

[103] Goodman, op. cit., p. 25.

Research Regarding Syntax and Comprehension

Gray and Leary found some indication that the correlation between comprehension difficulty and grammatical complexity changes with the reading ability of the subjects in their study, What Makes a Book Readable.[105] Flesch[106] found correlations of .66 and .47 between comprehension difficulty of passages and the mean number of syllables and words in sentences. Thus it appears that grammatical complexity rather than sentence length is a significant factor in comprehension.

Bormuth[107] has conducted several studies that are relevant to this problem. In one study he correlated measures of frequency, mean word depth, and length of independent clauses and whether the correlations changed as the subjects increased in reading achievement. The interaction between the reading achievement of the subjects and levels on the grammatical complexity measure was significant. All three measures of grammatical complexity correlated significantly with comprehension difficulty. In another study Bormuth[108] found that large proportions of children in school are unable to interpret the basic syntactic structures by which language signals information.

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[104] Archbald A. Hill, op. cit., p. 261.

[105] William S. Gray, and Bernice A. Leary, What Makes a Book Readable. (Chicago: The University of Chicago Press, 1935), p. 70.

[106] Rudolf Flesch, "A New Readability Yardstick." Journal of Analytic Psychology. (1948), pp. 239-253.

[107] Bormuth, op. cit., "New Measures of Grammatical Complexity."

Ruddell[109] investigated the relationship between a program that emphasized language structure to achievement in first grade reading. A program was designed by the investigator to stress language structure as related to meaning. This program was used to supplement the program in regular use. It was found in this study that the program possessing consistent correspondences (phoneme-grapheme correspondences) and emphasizing language structure as related to meaning produced significantly higher (a) paragraph meaning comprehension, and (b) sentence meaning comprehension achievement, than the program possessing only consistent correspondences.[110] Ruddell concluded that paragraph meaning comprehension, sentence meaning comprehension, and vocabulary achievement of first grade subjects were a function of the control which subjects exhibited over designated aspects of morphological language system, and syntactical language system at the beginning of grade one.

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[108] John R. Bormuth, op. cit., "The Effectiveness of Current Procedures for Teaching Reading Comprehension."

[109] Robert B. Ruddell, "The Relation of Grapheme-Phoneme Correspondences and of Language Structure to Achievement in First Grade Reading." in The Psycholinguistic Nature of the Reading Process. (Detroit: Wayne State University Press, 1968), p. 268.

[110] Ruddell, op. cit., p. 268.

Nuruss[111] studied the relationship of syntactic structure and comprehension difficulty through oral reading errors made by second grade children in sentences of varied levels of syntactic complexity. The results of her study indicated that there was a relationship between the number of oral reading errors a child made and the syntactic complexity of the sentence being read. She found that many of the types of errors children made appeared to indicate comprehension of the sentence, although the child did not read the exact words in the passage.

The relationship between reading comprehension and material written with frequent and infrequent oral language patterns of children was investigated by Tatham.[112] She used passages written with frequent oral language patterns and passages written with infrequent oral language patterns with second and fourth grade students. She found that second and fourth graders comprehend material written with frequent oral language patterns better than material written with infrequent oral language patterns. She also found that knowledge of sentence patterns was significantly related to reading comprehension. On the basis of this study she concluded that knowledge of structure of language is an important factor in reading comprehension.

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[111] Jean Nuruss, "The Relationship of Syntactic Structure and Comprehension Difficulty." Reading Teacher. (March, 1969), p. 16.

[112] Susan M. Tatham, Reading Comprehension of Materials Written with Select Oral Language Patterns: A Study of Grade Two and Four. Research for the doctoral thesis at the University of Wisconsin-Madison, 1968.

Sauer[113] studied fourth grade children's knowledge of grammatical structure and reading comprehension. She used sentences written in four basic sentence patterns for this study. The subjects read the sentences and answered questions based on the sentences. The outcomes of this study indicated that children's comprehension of the four basic sentence patterns differed significantly. She also found that knowledge of sentence patterns was significantly related to reading comprehension. On the basis of this study she concluded that knowledge of structure of language is an important factor in reading comprehension.

The importance of syntax in relation to reading comprehension has been developed in the literature presented in this section. Grammatical complexity appears to be related to difficulty level of reading content. Instruction for children in grammatical structure improves reading comprehension. However, more specific information is needed regarding the types of syntactical structure that are more difficult to comprehend. Information is also needed regarding instructional materials and instructional techniques.

Summary

The literature and research cited in the comprehension section of this paper suggest the need for further clarification and research of the factors involved in comprehension. The literature cited in the area of conjunctions indicates that conjunctions are empty words whose significance lies in the relationships they signal within sentences and between sentences. The limited amount of research available related to conjunctions supports the theory that a relationship exists between conjunctions and reading comprehension. The literature and research cited in the area of syntax and comprehension further support the theorized relationship between complexity of syntactic structure and reading comprehension. The next chapter will describe the sample, standardized instruments, construction of instruments to measure comprehension of conjunctions, and collection of data for this study. The current study was designed to further explore the relationship between understanding conjunctions and reading comprehension.

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[113] Lois E. Sauer, "Fourth Grade Children's Knowledge of Grammatical Structure and its Relation to Reading Comprehension." A doctoral dissertation, University of Wisconsin, 1968.

CHAPTER III

DESIGN AND METHODOLOGY

This study involved the study of the relationships of a number of variables. Two standardized instruments and two instruments which were designed by the principal investigator, were given to fourth grade pupils. The standardized instruments included a test of mental ability and a test of reading comprehension. The tests specifically designed for this study were a multiple choice test and a cloze test. The data collected was analyzed using computer programs, a partial correlation, analyses of variance, a binomial test, a chi square, item analysis, and Kuder-Richardson formulas 20 and 21.

Instrumentation

Selection of Standardized Tests

The two standardized instruments used in this study were the Pintner Intermediate Test, and the Stanford Achievement Test in reading. The Pintner Intermediate Test:[1] Form A (verbal ability series) was selected to provide data regarding general mental ability. It is organized in a series of eight batteries which include: vocabulary, logical selection, number sequence, best answer, classification, opposites, analogies, and arithmetic reasoning. This test is designed to provide for measurement of a variety of skills or abilities which constitute different aspects of mental ability. A mental age score and intelligence quotient are yielded by this instrument. Data from this instrument permits a partial correlation required to control the effect of intelligence in this study.

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[1] Rudolph Pintner, Pintner General Ability Tests. (Verbal Series) (New York: Harcourt, Brace and World, Inc., 1942).

Selection of the Pintner Intermediate Test was made for two reasons. This test is an extension of the mental ability test used in the U.S.O.E. Cooperative Primary Reading Studies:[2] therefore, it contributes to cumulative research. The use of this study permits comparison of data from a number of previous studies. The second reason for the use of this test was the quality of the test. The Pintner Intermediate Test samples a broad range of the effects of the child's total environment. The author of the test defined intelligence as "that which enables a child to do school work, yet is not dependent upon the school experience itself."[3] Reliability for the test was obtained by the split-half and interform methods for the various batteries. Reliability is .90. Standardization is based on 100,000 tests administered in widely separated parts of the country. This test is reviewed for the Buros Yearbook of Tests and Measurements by Stanley S. Marzolf, who states that it is "one of the best available for the schools."[4] He also notes the attempt by the authors of this test to make tests comparable at all grade levels.

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[2] Dykstra, op. cit., p. 70.

[3] Marzolf, Stanley S., The Third Mental Measurements Yearbook. ed. Oscar K. Buros, (New Brunswick: Rutgers University Press, 1949), p. 255.

[4] Buros, op. cit., p. 256.

The Stanford Achievement Test[5] (Intermediate I, Form W) was selected for collection of reading comprehension data. This instrument consists of a word meaning test and a paragraph meaning test. Data from the paragraph meaning test will be used for correlation in this study.

The Stanford Achievement Test was selected for this study for the sam reasons that the Pintner Intermediate Test was selected. First, because it represents an extension of the reading achievement test used in the U.S. Office of Education Cooperative Primary Reading Studies. Use of this test permits comparison of the data collected in this study with the data collected in the U.S. Office of Education Cooperative Primary Reading Studies; thus contributing to cumulative research. The second reason for selection of this instrument is that it is a valid, reliable instrument. The Stanford Reading Test is based on "content of the typical elementary school curriculum;"[6] and this was the type of curriculum that the subjects participating in this study had encountered. Reliability for the test was obtained by the split-half reliability method. The split-half scores ranged from .82 to .92 with half of them over .90. Norms for this instrument were based on 350,000 pupils selected from all areas of the country, all types of school systems, and all socioeconomic levels. In reviewing this instrument for the Buros Yearbook, Helen Robinson states, "that it is among the best survey tests of reading achievement for elementary grades."[7]

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[5] Truman L. Kelley, Richard Madden, Eric F. Gardner, Herbert C. Rudman, Stanford Achievement Test, (Reading Test Series) New York: Harcourt, Brace and World, Inc. 1964).

[6] Helen Robinson, The Sixth Mental Measurements Yearbook. ed. Oscar R. Buros, (Highland Park, New Jersey: The Gryphon Press, 1965), p. 656.

Therefore, both the Pintner Intermediate Test and the Stanford Reading Tests were found to be valid and reliable for the objectives of this study. These tests, provide valid and reliable data; furthermore, use of these instruments also permits comparison of data from this study with data from other studies.

Development of Comprehension of Conjunction Tests

Selection of Conjunctions

This section discusses the selection and definition of conjunctions to be investigated in this study. Development of the multiple choice tests and the cloze test are also presented in this section.

The conjunctions to be investigated in this study were selected through the consideration of five factors:

(1) vocabulary lists
(2) frequency of usage lists
(3) findings of previous research
(4) lists of conjunctions developed by authorities in the field
(5) definitions of conjunctions

Basic vocabulary lists and conjunctions list were consulted as the basis for selection of conjunctions to study. Classification of conjunctions and function words (some authors include conjunctions in this class of words) developed by authorities in English grammar as well as published research were consulted to determine a group of conjunctions basic to the English language.

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[7] Buros, op. cit., p. 256.

Fries[8] studied English grammar through examining some 3,000 letters written by subjects in his study. He found that seven function words accounted for 84.9 percent of the instances of usage of function words. Five more, or a total of twelve words in all, account for 92.2 percent of the instances of usage of function words. These words are listed in Table 2 in the Appendix.

Robertson[9] selected 17 connectives for study, on the following factors: (1) frequency of occurrence in the basal reader sentence analysis; (2) the multiplicity of meanings of the connectives; (3) the homographs of the connectors; (4) the findings of previously published research; and (5) the classes of connectives. The connectives selected by Robertson are found in Table 2 in the Appendix.

The lists of conjunctions developed by experts in the fields of grammar and linguistics were also consulted. The lists in this category were developed by Fernald,[10] Long,[11] Strang,[12] Whitehall,[13] Mellon ,[14] and Schuster[15] are presented in Table 2 of the Appendix. After comparing the lists of conjunctions derived from previous research and experts in the field of grammar and linguistics, a list was compiled of the words which appeared on the majority of these lists for further consideration.

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[8] Fries, op. cit., p. 207.

[9] Robertson, op. cit., p. 394.

[10] Fernald, op. cit., pp. 195-275.

[11] Long, op. cit., p. 207.

[12] Strang, op. cit., p. 173.

[13] Whitehall, op.cit., p. 60.

[14] John C. Mellon, Complex and Conjunctive Transformations. (Culver, Indiana: Culver Military Academy, 1964), p. 180.

The list described above was then used for comparison with frequency lists. Frequency lists provide information regarding the frequency and range of occurrence for specific words. Among the various frequency lists available, one of the most valuable lists was A General Service List of English Words[16] by West. This list provides the frequency of usage in various functions for words. This is significant because it is important to know how frequently they are used in some other role. Other frequency lists were consulted also for information as to frequency and range of occurrence. "A Basic Vocabulary of Elementary School Children,"[17] by Rinsland lists the raw cumulative frequency of words through the fourth grade. Rinsland has listed the 14,571 words occurring three or more times in any one grade level. The Dale List[18] of approximately three thousand familiar words represents words that are known by at least 80 percent of the children in grade four.[19] "A Minimum Reading-Spelling Vocabulary for Remedial Work," was developed by Spache.[20] The words in this list are placed in levels of reading difficulty, and following each word is a spelling grade placement. The Dolch List[21] is a list of 220 basic sight words. "These 200 words make up from 50 percent to 75 percent of all ordinary reading matter. They should be recognized on sight by all school children."[22] The vocabulary frequency lists are compiled in Table 3 of the Appendix.

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[15] Schuster, op. cit., p. 341.

[16] Michael West, A General Service List of English Words. (New York: Longmans, Green and Company, 1953).

[17] Henry D. Rinsland, Basic Vocabulary of Elementary School Children. (New York: The Macmillan Company, 1945).

[18] Edgar Dale, and Jeanne S. Chall, A Formula for Predicting Readability, (Columbus, Ohio: Bureau of Educational Research, The Ohio State University, 1948), pp. 19-28.

The conjunctions appearing with the highest frequency on the majority of lists were selected for investigation in this study. The following conjunctions were those selected: and, but, yet, nor, or, than, for, so, if, though, while, how, that, when, where, which, because, either, neither, now, since. This list included the frequently used conjunctions, but not so many as to make the study unmanageable.

The five factors cited were related to determine the conjunctions that should be investigated in this study. The words either and neither were not as high in frequency of occurrence as some other words; however, either and neither are defined as conjunctions and the majority of their occurrence is in the conjunctive function. A number of the other words appearing on the list, such as after, are defined as prepositions, and usually occur in the prepositional function. These words were excluded from the present study.

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[19] Dale, op. cit., p. 18.

[20] George Spache, "A Minimum Reading-Spelling Vocabulary for Remedial Work." Journal of Educational Research, (November, 1939), pp. 161-173.

[21] E. W. Dolch, Methods in Reading. (Champaign, Illinois: The Garrard Press, 1955), pp. 373-374.

[22] Dolch, op. cit., p. 373.

Definitions of Conjunctions

After the most frequently occurring conjunctions were selected from the data compiled in Table 3, the next step was the development of definitions for the selected conjunctions. The following dictionaries were consulted as the definitions were developed: The World Book Dictionary,[23] The American Heritage Dictionary,[24] and The Random House Dictionary of the English Language.[25] On the basis of the definitions derived from these sources and the functional use of conjunctions, working definitions of the conjunctions were developed for this study. The definitions developed as follows:

and	And is used to connect words, phrases or clauses that have the same grammatical function in a construction. There are several definitions for and: (1) together,

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[23] Clarence L. Barnhart, ed., The World Book Dictionary. (Chicago, Illinois: Field Enterprises Educational Corporation, 1963).

[24] William Morris, Editor, The American Heritage Dictionary of the English Language. (New York: American Heritage Publishing Co. Inc. and Houghton Mifflin Company, 1969).

[25] Jess Stein, Editor in Chief, The Random House Dictionary of the English Language. (The Unabridged edition), (New York: Random House Inc., 1967).

	also, in addition; (2) added to; (3) as a result. And signals a relationship of addition.
as	As is used as a comparative term to express equality. As signals a relationship of comparison.
because	Because is used as a conjunction meaning "since," or "for the reason that," Because signals a relationship of qualification.
but	But has several definitions: (1) on the contrary; (2) however, yet; (3) except, save; (4) with the (5)other than. But signals a relationship of contrast.
if	When if is used as a conjunction it means "in the event that"; "or on the condition that." If signals a relationship of qualification.
for	When for is used as a conjunction it is defined as "because" or "since." For signals a relationship of illation.
how	When how functions as a conjunction it is defined as "the way in which." How signals a relationship of incorporation.
neither, nor	Neither . nor means "not either" or "not in either case." Neither . nor signals a relationship of alternation.

now	When now is used as a conjunction it means "since" or "seeing that." Now signals a relationship of qualification.
or	When or functions as a conjunction it is used to connect words, phrases, or clauses representing alternatives. Or signals a relationship of alternation.
since	When since is used as a conjunction it is defined as "the time when," "because," or "in view of the fact." Since signals a relationship of qualification.
so	So is defined as "in order that" or "with the result that" when used as a conjunction. So signals a relationship of illation.
than	Than is used to mean in comparison with. Usually than is used to mean in comparison of unequal quantities. Than signals a relationship of alternation.
that	That is used to introduce a subordinate clause which expresses cause, reason, purpose or result. That signals a relationship of incorporation.
though	When though is used as a conjunction it is defined as, "although," "even if," "however," or "yet." Though signals a relationship of qualification.

where	When *where* is used as a conjunction it is defined as "at what or which place"; "in a place which." *Where* signals a relationship of qualification.
when	*When* is defined as, "at the time which," or "though," when used as a conjunction. *When* signals a relationship of qualification.
while	*While* is defined as, "as long as," or "during the time that." *While* signals a relationship of qualification.
yet	When *yet* is used as a conjunction it is defined as "though," "still," or "nevertheless." *Yet* signals a relationship of contrast.

After developing twenty-five multiple-choice items the principal investigator administered the items in a pilot study to nine fourth graders in a Columbus Puclic School. The teacher was asked to select three children in a high achievement range, three children in the average achievement range, and three children in the low achievement range. An introspective technique was used, whereby the subjects individually read the test items and told the investigator which answer they had chosen and why they had chosen those answers. After using this technique it was found that children did not understand the wording in certain items, so they were reworded and a Comprehension of Conjunctions Test of fifty items was developed.

A second pilot study was designed to validate this instrument. The pilot study involved administration of the instrument to sixty fourth grade students, who were members of intact classroom groups in an elementary school at Ashville, Ohio. The data collected from this study was analyzed using the Kuder-Richardson formula 21; and the outcome was a reliability coefficient of .88. An item analysis was performed on this data, which served as a basis for test revision. Two items were found to have a negative discrimination index; therefore, these items were eliminated from the test. The test was also extended from 50 items to 63 items in an effort to extend the reliability of the instrument. A copy of this revised instrument which was used in the final study is found in the Appendix.

Multiple Choice Test Construction

A multiple choice instrument was constructed on the basis of the list of conjunctions and the definitions developed. This instrument was designed to measure relationships commonly signaled by conjunctions. The instrument was constructed utilizing items constructed in the following manner. Each test item was a sentence including a conjunction for four alternative responses. One alternative stated the same relationship as the sentence; another alternative made sense, but the relationship was not the one stated in the sentence; a third alternative gave a relationship similar to the correct answer,but not the correct answer because the relationship was not the same one as that in the original sentence; the fourth alternative gave a relationship that is totally incorrect, and did not make sense. The subject responded to the items

TABLE 4

THE STRUCTURE OF AN INDIVIDUAL TEST ITEM

Answers given in one test item	Conjunction fits the Meaning of the Sentence	Answer makes sense
(a) correct answer	yes	yes
(b) incorrect answer	no	yes
(c) incorrect answer	no	no
(d) incorrect answer	no	may or may not

TABLE 5

RELIABILITY OF FINAL INSTRUMENT

Subjects	Items	Reliability
60	63	.88

by choosing the one word or phrase which stated the relationship indicated by the conjunction underlined in the sentence.

Cloze Test Construction

The cloze procedure was selected for measuring comprehension and readability of selections involving a high number of conjunctions, half as many conjunctions, and no conjunctions. This test was used as a second measure of comprehension of conjunctions, and is entitled The Cloze Comprehension of Conjunctions Test. It is based on the assumption that cloze tests are influenced not only by the reading material itself, but by the reader's characteristics which influence the difficulty of the materials for that reader.[26]

The cloze procedure has been used and validated for measurement of comprehension and readability.[27] It is a procedure that is constructed by replacing every fifth word in a reading passage with an underlined blank of standard length; the first and last sentence in each passage is complete (no words deleted). When taking the test, the subject writes in each blank the word he thinks was deleted.

Bormuth[28] used a cloze test in conducting a study of 150 fourth, fifth, and sixth grade pupils. On the basis of this study, he says,

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[26] Ruth Gallant, "Use of Cloze Tests as a Measure of Readability in the Primary Grades," in Reading and Inquiry. J. A. Figurel (ed), (Newark, Delaware: The International Reading Association, 1965) 10, 286-287.

[27] Gallant, op. cit., p. 286.

[28] J. R. Bormuth, op. cit., "Comparisons Among Cloze Test Scoring Methods." pp. 286-291.

"It appears, at least under the conditions of the present study that cloze tests made by deleting every fifth word measure skills closely related or identical to those measured by conventional multiple-choice reading comprehension tests."[29] Jenkinson,[30] Ruddell,[31] and Bormuth[32] found correlations between standardized tests of reading comprehension ability and cloze tests from .70 to .85. Gallant[33] reports a study of the cloze test used with primary grade students. In this study Gallant found the reliability of the cloze test by split-half reliability coefficients for odd-even items, and corrected by application of the Spearman-Brown formula. The reliability coefficients ranged from .90 to .97 and were significant at the .01 level of confidence. The findings of this study indicate that the cloze tests were both valid and reliable measures of reading comprehension for primary grade pupils.

The passages used in the Cloze Comprehension of Conjunctions Test developed for this study were developed in this way: (a) one passage with many conjunctions, there were thirty three conjunctions in this passage; (b) a passage with half as many conjunctions, there were fifteen conjunctions in this passage; (c) a passage with no conjunctions was developed. A binomial test was used to test the significance of difference between the three passages. The number of conjunctions in the three levels was determined by differences in number of conjunctions significant at the .001 level. The difference between the passage with a high number of conjunctions, and the passage with half as many conjunctions was significant with a probability of .0082. The difference between the passage with half as many conjunctions and the passage with no conjunctions was significant with a probability of .0013. The difference between the passage with a high number of conjunctions and the passage with no conjunctions was significant with a probability of .00003. This data is summarized in Table 6.

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[29] John R. Bormuth, "Factor Validity of Cloze Tests as Measures of Reading Comprehension Ability." Reading Research Quarterly. (Spring, 1969), p. 358-365.

[30] M. E. Jenkinson, Selected Processes and Difficulties in Reading Comprehension. Unpublished doctoral dissertation, University of Chicago, 1957.

[31] R. B. Ruddell, An Investigation of the Effects of the Similarity of Oral and Written Patterns of Language Structure on Reading Comprehension. Unpublished doctoral dissertation, Indiana University, 1963.

[32] Bormuth, op. cit., p. 286.

[33] Gallant, op. cit., p. 287.

TABLE 6

SIGNIFICANCE OF DIFFERENCE - CLOZE TEST PASSAGES

Passage	No. of Conjunctions	Z Score	Probability
High conjunctions	33	2.45	.0082
Half as many conjunctions	15	3.06	.0013
No conjunctions	0	5.87	.00003

The readability of the passages in the Cloze Comprehension of Conjunctions Test was measured through the use of the Lorge Readability Formula.[34] The Lorge Index for the passages are as follows: (a) 2.4548; (b) 2.4839; (c) 2.2960. The Lorge Readability formula measures vocabulary load, sentence length, and number of prepositional phrases in order to control reading difficulty. Readability was controlled at this level so that difficulty of content would not be a central problem to the subjects; thus the difficulty encountered in reading these passages was due to the difference in number of conjunctions. The passages were developed around the topics of baseball, spring, and kite flying since children at this age are interested in sports, and informational books.[35,36]

POPULATION AND SAMPLE

In selecting a grade level for study, fourth grade was chosen because previous studies indicate that children at this level begin to make wider use of conjunctions. Loban[37] found that children in fourth schools in this category. Thus a total of fourteen elementary schools were included in this study.

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[34] Irving Lorge, "Predicting Reading Difficulty of Selections for Children." Elementary English Review. (October, 1939),pp. 229-233.

[35] May Hill Arbuthnot, "Old Values in New Books," in Ivory Apes and Peacocks. (Champaign, Illinois: National Council of Teachers of English, 1968), p. 19.

[36] Charlotte S. Huck and Doris Young Kuhn, Children's Literature in the Elementary School. (New York: Holt, Rinehart and Winston, 1961), p. 34.

[37] Walter D. Loban, op. cit., pp. 82-87.

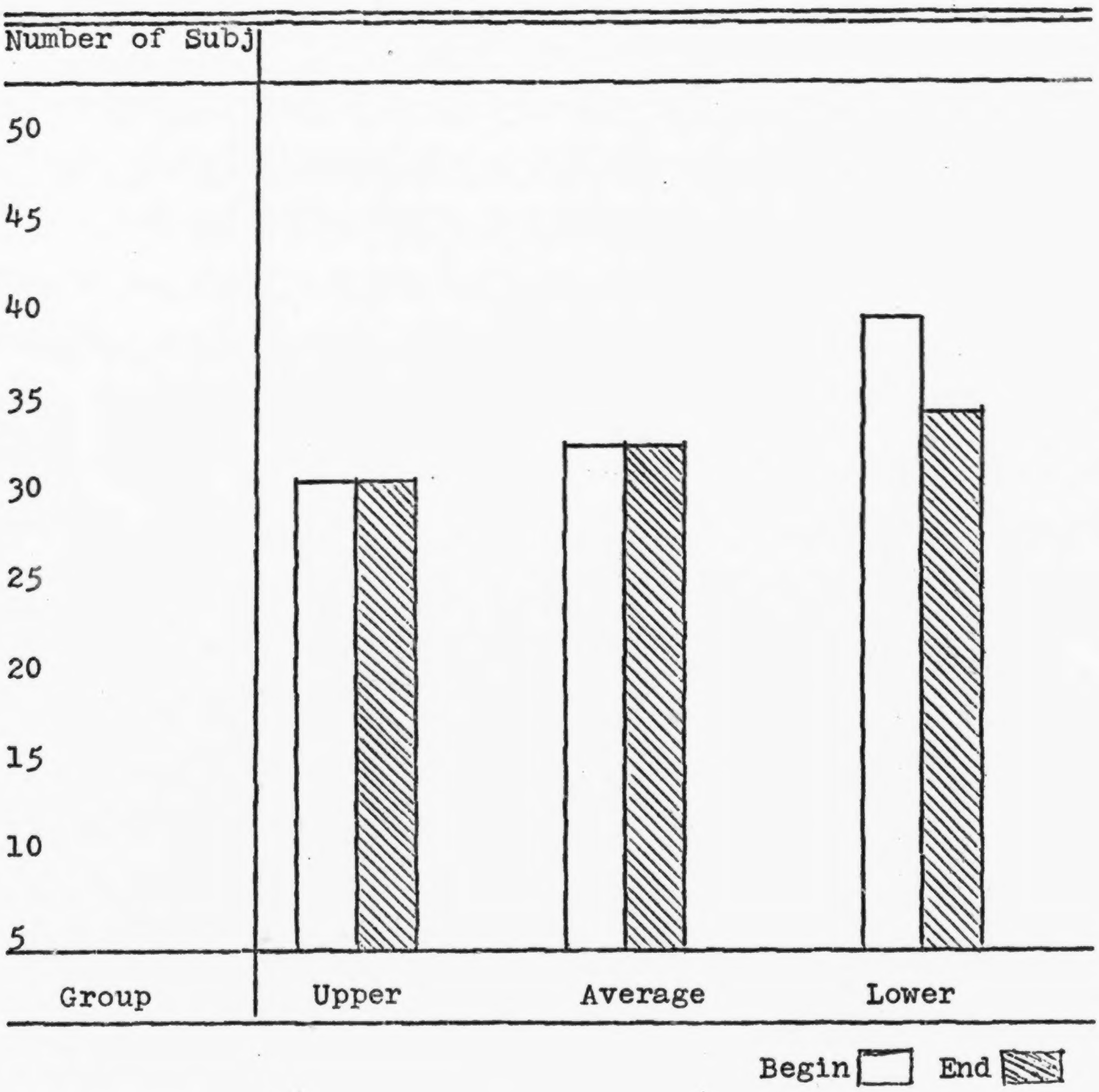
The school system provided a listing of all fourth grade students. The names of subjects for a stratified random sample were drawn from this list using a table of random numbers. The original population of this study included thirty children in the upper level, thirty-one children at the middle level and thirty-nine children at the lower level (Table 7). A larger number of subjects were included at the lower level because children attending these schools are often transient, thus creating difficulty when attempting to administer four tests to each subject over a three week period. The larger number of subjects at the lower level allowed for attrition without permitting the number of subjects in this classification to fall below thirty. Complete data for this study is available for ninety-five subjects. Total data were collected for all children in the upper and middle levels and for thirty-five of the thirty-nine subjects in the lower level; therefore, total attrition was four subjects in the lower socioeconomic level.

DATA COLLECTION

Each subject participating in the study spent approximately 125 minutes in testing time. The Pintner Test required 45 minutes, The Stanford required 40 minutes, the Comprehension of Conjunctions Test required 30 minutes, and the Cloze Comprehension of Conjunctions Test required 40 minutes. Each subject was allowed enough time to complete the Comprehension of Conjunctions Test and The Cloze Comprehension

TABLE 7

SUBJECTS



grade show considerable improvement in control of words per maze when compared with kindergarten through grade three pupils. Another study[38] determined that productive control of syntax was striking at grade five when compared with grade three, but the study did not include children in the fourth grade. Hunt[39] studied children's writing at the fourth grade level, and found that children use in writing an increasing amount of subordination as they progress through school. He found that fourth graders combined sentences by coordinating four or five times as often as twelfth graders in the same number of words. Usually sentence coordination is accomplished through using the word and at this level.

Mansfield, Ohio was chosen as the site for this study. It is a medium-sized industrial city and has a representative population including upper-middle class, middle-class, and lower-class students. In order to select a stratified random sample, it was necessary to classify the schools within the school system as to socioeconomic levels. The classification of schools into socioeconomic levels was accomplished with the assistance of Elementary Principals, Superintendent of Schools, and the Director of Elementary Education, who met to determine one school classified as the upper level, and three classified as average. The schools designated by the government as recipients of Title One ESEA assistance were classified as low socioeconomic level; there were eight of Conjunctions Test as these were not timed instruments. These instruments are not timed because the objective in using them is to determine reading comprehension power. The standardized instruments were carefully timed in accordance with the directions for administration.

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[38] Ray C. O'Donnell, William J. Griffin, Raymond C. Norris, Syntax of Kindergarten and Elementary School Children: A Transformational Analysis. (Champaign, Illinois: National Council of Teachers of English, 1967), p. 99.

[39] Kellogg W. Hunt, Grammatical Structures Written at Three Grade Levels. (Champaign, Illinois: National Countil of Teachers of English, 1965), p. 35.

The tests were administered in the elementary schools participating in the study by four graduate students majoring in education. Each test administrator was provided with a detailed set of instructions for each instrument. After thorough study of the instruments and instructions, the test administrators met with the principal investigator for further instruction as to the tests, timing, location, and order of administration. In addition to individual study on the part of test administrators, approximately one and one-half hours were spent in preparation for test administration as a group.

The tests were administered in the following manner. The first day, one half of the subjects received the *Stanford Test*, and the other half of the subjects received the *Pintner Test*. The second day this procedure was reversed. The third day of testing, half of the subjects received the Comprehension of Conjunctions Test and the other half The Cloze Comprehension of Conjunctions Test. The fourth day of testing this procedure was reversed. A fifth day of testing was required for testing students who had missed tests on previous testing days; at the end of the fifth day of testing all tests had been administered to all students included in the study except the four students who had moved from the city. Thus, the four instruments were administered in a three week period to ninety-five subjects.

The standardized testing instruments were scored by hand using scoring mats provided by the publishing company. The Cloze Comprehension of Conjunctions was scored by the established procedure of marking wrong any word that did not agree exactly with the original passage.[40] The key for scoring the Cloze Comprehension of Conjunctions Test was prepared by the principal investigator. The multiple choice test was scored by hand with a key prepared by the principal investigator. The tests were scored and the scoring rechecked by the personnel who administered the tests, assisted by two undergraduate students in education who were employed for this purpose.

SUMMARY

Two standardized tests were selected for measuring mental ability and reading comprehension achievement, on the basis of reliability and validity, as well as the contribution they would make in relating this research study to prior studies. Two instruments were designed by the principal investigator; these instruments were designed to secure data regarding comprehension of conjunctions, and readability of conjunctions. Lists of conjunctions, vocabulary lists, and definitions of conjunctions were consulted as a basis for test construction. The four instruments were administered to ninety-five fourth graders, who were selected on the basis of a stratified random sample. The data from the administration of the four instruments was correlated to determine whether a relationship existed between reading comprehension, readability of content, and understanding of conjunctions.

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[40] Bormuth, op. cit., "Comparisons Among Cloze Test Scoring Methods."

The next chapter of this paper will present and analyze the data collected. The last chapter of the paper will present the conclusions based upon the outcomes of the study.

CHAPTER IV

COLLECTION AND ANALYSIS OF DATA

Written language is one of man's vehicles of communication, he writes what he intends others or himself to read; however, if the reader cannot understand his message communication is not complete. The reader should be able to understand the literal meaning of the message, the significance of the message, and relate it to other messages. This investigation was designed as an effort to help improve understanding of this communication process.

The primary concern of this research was to investigate the relationship between understanding conjunctions and reading comprehension. Knowledge regarding this relationship enables educators to better understand comprehension, to better design reading materials, and to better plan methodology for teaching reading. Educators will be enabled to plan instruction which will meet the individual needs of students through knowledge regarding the relationship of variables such as sex, socioeconomic level, and intelligence to comprehension of conjunctions.

This investigation had three problem areas. The first problem area was the relationship between understanding of conjunctions and reading comprehension. The second problem area was the difficulty level of the individual conjunctions studied. The third problem area was the relationship between the understanding of conjunctions and the demographic variables of sex, socioeconomic level, and intelligence. The design of this investigation called for measuring understanding of conjunctions and reading comprehension, to do so required the development of two tests for measuring comprehension of conjunctions. These two tests, along with other standardized instruments, were administered to the subjects.

This chapter of the study has a threefold purpose: (1) to describe the types of data collected; (2) to describe the analysis of the data; and (3) to report the results of the study.

Description of Data Collected

A multiple-choice test, The Comprehension of Conjunctions Test, and a cloze test, The Cloze Comprehension of Conjunctions Test, were developed by the principal investigator. These instruments, along with the Stanford Reading Achievement Test and the Pintner General Ability Test, were administered to a stratified random sample of ninety-five fourth grade students in Mansfield, Ohio city schools. The tests were administered by graduate students at The Ohio State University who were trained to administer the tests. The data collected from each subject included the following:

1. reading achievement in comprehension
2. comprehension of conjunctions (a multiple-choice test)
3. comprehension of conjunctions (cloze test)

4. socioeconomic status of school attended
5. sex
6. mental ability

In order to show clearly the results obtained, the data pertaining to each variable will be first considered separately. Then the individual relationships among the variables will be considered. The relationships among the various variables will be presented and discussed in a later section of this chapter. The basic data for all measures on all subjects are presented in Tables 9, 10, 11, 12.

The tests were scored and rechecked by four graduate students and two undergraduate students. The major portion of the statistical work related to this study was accomplished by use of the computer services at The Ohio State University. The computer program was planned with the assistance of a computer consultant in the College of Education. The personnel in the Statistics Laboratory at The Ohio State University provided guidance and verification of calculations. The item analysis and Kuder-Richardson formulas 20 and 21 were performed by the Center for Measurement and Evaluation at The Ohio State University.

Test Reliability of Non-Standardized Tests and Item Analysis

Kuder-Richardson formulas 20 and 21 were computed to determine the reliability of the Comprehension of Conjunctions Test. The Kuder-Richardson formula 20[1] is an index of the internal consistency of the test and is a function of the number of items on the test, the variability of the scores, and the proportion passing and failing each item. The formula is as follows: $r_{tt} = \frac{k}{k-1} \quad \frac{1-pq}{s^2}$. The reliability coefficient yielded by the Kuder-Richardson formula 20 for the Comprehension of Conjunctions Test was .898.

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[1] N. M. Downie and R. W. Heath, Basic Statistical Methods. (New York: Harper and Row, Publishers, 1959), p. 220.

Kuder-Richardson formula 21[2] is also an estimate of internal consistency of reliability and is computed as the Kuder-Richardson formula 20 except the mean score of the group is used instead of the proportion passing and failing each item. The formula is as follows:

$$r_{tt} = \frac{n}{n-1} \cdot \frac{{}^{2}t-n\ \bar{p}\ \bar{q}}{t^2} .$$

The reliability coefficient yielded by Kuder-Richardson formula 21 for this instrument was .880. The reliability coefficients yielded by the Kuder-Richardson formulas may be considered a minimum estimate of the reliability of a test,[3] therefore, eliminating the danger of overestimating reliability. The reliability coefficients of .898 and .880 are sufficiently high so it can reasonably be assumed that this is a reliable test.[4]

Reliability coefficients were not computed for the Cloze Comprehension of Conjunctions Test, as the reliability of this procedure has been well established by previous research. Studies by Bormuth,[5] Jenkinson,[6] and Ruddell[7] provide correlations between standardized tests of reading comprehension ability and cloze tests of .70 to .85. Gallant[8] reports reliability coefficients which range from .90 to .97 and were significant at the .01 level of confidence.

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[2] M. W. Richardson and G. F. Kuder, "The Calculation of Test Reliability Coefficients Based upon the Method of Rational Equivalence," Journal of Educational Psychology, XXX (1939), pp. 681-687.

[3] Walter B. Borg, Educational Research: An Introduction. (New York: David McKay Company, Inc., 1936), p. 86.

[4] Downie, and Heath, op. cit., p. 220.

An item analysis was computed to determine the discrimination index, relative difficulty, and total correct for each item. The relative difficulty for the Comprehension of Conjunctions Test ranged from .084 to .816. The discrimination index reflects the degree to which the item discriminates between the upper and lower achievement groups of subjects taking the test. The discrimination index for this test ranged from 4.4 to 81.5. The total correct is the percentage of subjects answering the item correctly. The total correct ranges from 8.4 to 91.6. The item analysis data for the Comprehension of Conjunctions Test is summarized in Table 8 which is found in the Appendix.

An item analysis was not performed on the Cloze Comprehension of Conjunctions Test, as it could not help improve or analyze the test.

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[5] Bormuth, _op. cit._, p. 365.

[6] Jenkinson, _op. cit._, p. 60.

[7] Ruddell, _op. cit._, p. 65.

[8] Gallant, _op. cit._, p. 287.

Comprehension of Conjunctions Test:

The results of the Comprehension of Conjunctions Test are described in this section. This test is a multiple-choice instrument developed by the principal investigator. There are sixty-three items on the test. This is an untimed instrument as it is designed to measure the power of comprehension.

The distribution of test scores made by the subjects on this test is shown in Table 9 in the Appendix. Inspection of this table shows that the test scores range from 57 to 14 which is a range of 43 points. The mean for this test was 33.12 while the standard deviation was 11.68. The wide range in scores and the large standard deviation of 11.68 indicate the broad variability of the subject's achievement on this test.

Cloze Comprehension of Conjunctions Test:

The Cloze Comprehension of Conjunctions Test results are presented in this section. This test consisted of three passages written by the principal investigator. One passage contained a high number of conjunctions, the second passage contained an average number of conjunctions, and the third passage contained no conjunctions.

The means for the three passages are as follows: passage one, 36.98; passage two, 51.03; and passage three, 53.48. The standard deviations for the three passages are as follows: passage one, 16.07; passage two, 16.02; and passage three, 20.47. The range of scores is as follows: passage one, 64-0, a range of 64 points; passage two, 85-0, a range of 85 points; and passage three, 83-0, a range of 83 points. The large standard deviations and the range of scores for the three passages indicate the variability of achievement on this test. The results of this test are reported in Table 10 in the Appendix.

Pintner Mental Ability Test:

The results of the Pintner Mental Ability Test are presented in this section. This is a standardized multiple-choice instrument. Test booklets and separate answer sheets were used in administering this test. This test is a timed instrument; the subjects were allowed fifty minutes to complete this test as specified by the directions accompanying the test.

The distribution of intelligence quotients as determined by this test are shown in Table 11 which is found in the Appendix. Inspection of this table indicates the mean for the test was 108.85, and the standard deviation was 18.39. The scores range from 154 to 67 which is a range of 87 points. Both the range of scores, and the large standard deviation indicate the broad variability of subjects on this measure.

Stanford Reading Achievement Test in Comprehension:

This section presents the results of the Stanford Reading Achievement Test in Comprehension. This is a standardized multiple-choice instrument. Test booklets and separate answer sheets were used in administering this test. The subjects were allowed thirty minutes to complete this instrument as specified by the directions accompanying the test.

The distribution of the test scores made by subjects are shown in Table 12 in the Appendix. Inspection of this table indicates that the mean for the test was 45.29, and the standard deviation was 1.56. The range for this test was from 95 to 21 which is a range of 74 points. Although the range of scores for this test is broad, the standard deviation is small indicating that the subjects did not vary widely in achievement on this test.

Description of Data of Analysis

Seven measures were secured for the stratified random sample of fourth grade students who were subjects in this investigation. The measures include intelligence quotient, reading comprehension achievement, comprehension of conjunctions on a multiple-choice instrument, comprehension of conjunctions on three cloze passages, and socio-economic level. A variety of statistical procedures, summarized in Table 14, were used to show how these variables are related.

Item analysis was used to check the reliability and validity of the Comprehension of Conjunctions Test. Kuder-Richardson formulas 20 and 21 were also used to check the internal reliability of the test: see pages 144 and 145 for further information. (See Table 13 in Appendix.)

In order to explore hypothesis one of this study, a partial correlation was computed to assess the relationship between reading comprehension and comprehension of conjunctions while controlling the influence of intelligence. A partial correlation is used when the relationship between two variables is influenced by a third variable. With the partial correlation coefficient it is possible to control the effects of the third variable or to "partial them out." The formula for the

TABLE 14

STATISTICAL PROCEDURES

Statistical Procedures	Use of Procedures
Item Analysis	--check on the reliability and validity of the test --identification of most difficult test items --analysis of student achievement on test items
Kuder-Richardson Formula 20 Kuder-Richardson Formula 21	--check on the internal reliability of the test
Binomial Test	--analyze significance of difficulty of the test items
Chi Square	--analyze the significance of difficulty between test items
Correlation coefficient computation	--assessment of relationships between demographic variables and comprehension of conjunctions
Partial Correlation coefficient computation	--assessment of relationship between reading comprehension and comprehension of conjunctions while controlling the influence of intelligence.
One-way analysis of variance	--test significance of variations in student performance on the three cloze test passages

partial r is

$$r_{12.3} = \frac{r_{12} - (r_{13}\ r_{23})}{(1-r_{13}^2)\ (1-r_{23}^2)} \ .^{9}$$

The partial r is a Pearson r and may be interpreted as such.

Hypothesis one was further explored through computation of three one-way analyses of variance. The analyses of variance were computed to test the significance of variations in student achievement on the three Cloze Comprehension of Conjunctions passages. An analysis of variance is a statistic used to test the difference between groups, in this case the difference tested was the achievement on three test passages. The formula for this statistic has three parts as follows: between group variance, $x^2 = X^2 - \frac{(\quad X)^2}{N}$; within group variance, $x^2 = X^2 - \frac{(\quad X)^2}{n}$. An F test is used to test the difference between the two variances, the formula is as follows:

$$F = \frac{\text{Mean square for "between" groups}}{\text{Mean square for "within" groups}} \ .^{10}$$

Item analysis, binomial tests, and chi squares were computed in order to explore hypothesis two of this study. An item analysis was computed to determine the relative difficulty of test items on the Comprehension of Conjunctions Test; see pages   and   for further information. The binomial test was used to determine the significance of difficulty or ease of test items. The binomial distribution is the sampling distribution of the proportions we might observe in random samples

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[9] Downie and Heath, *op. cit.*, p. 203.

[10] Downie and Heath, op. cit., p. 180.

drawn from a two-class population. In this sample the two class population was the class of those who completed the item correctly and the class of those who did not complete it correctly. The formula for this test is as follows:

$$Z = \frac{(x \pm 15) - NP}{NPQ}\ .$$[11]

A chi square formula was used to test the significance of difficulty of items on the Comprehension of Conjunctions Test. The formula for this statistic is as follows:

$$x^2 = \frac{(O-E)^2}{E}.$$[12]

The third hypothesis in this study was analyzed through the eta correlation coefficients computed by the computer program,BMDO3R. This statistic is used when one of the variables is continuous and the other is not continuous. The formula is as follows:

$$r_{kj} = \frac{D_{kj}}{D_{kk}\ D_{jj}}.$$[13]

ANALYSIS OF RESULTS

The Relationship Between Reading Comprehension and Comprehension of Conjunctions

This section presents an analysis of the data collected. The data is explored in relation to the three hypotheses of the study.

The significance of correlation between a subject's ability to identify the relationships that conjunctions signal and his reading comprehension is explored in hypothesis one. The Comprehension of Conjunctions Test, The Cloze Comprehension of Conjunctions Test, The Stanford Achievement Test in comprehension, and The Pintner Test of Mental Ability were used to collect data for testing this hypothesis.

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[11] Sidney Siegel, Nonparametric Statistics. (New York: McGraw-Hill Book Company, Inc., 1956), p. 40.

[12] Downie and Heath, op. cit., p. 164.

[13] Bernard Ostle, Statistics in Research, (The Iowa State College Press, 1954); chapter 8.

A partial correlation was computed using data from computer program BMDO3R and the partial correlation formula. The partial correlation was used to control the effects of intelligence or "to partial them out." This procedure is used when the relationship between two variables is influenced by a third variable.[14] Smith and Dechant point out that "mental age scores have been found to be closely related to reading readiness and reading achievement."[15] Schoeller also states that "reasoning in reading, or a verbal factor, which is largely dependent on intelligence, has been shown to be the largest component of comprehension."[16]

The partial correlation was computed for the relationship between reading comprehension achievement as measured by the Stanford Reading Achievement Test and understanding of conjunctions as measured by the Comprehension of Conjunctions Test. The partial correlation coefficient for the relationship between reading comprehension and comprehension of conjunctions was .2415 which is significant at the .02 level. Therefore, hypothesis one was supported using the Comprehension of Conjunctions Test as a criterion. Table 15 presents these results.

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[14] Downie and Heath, op. cit., p. 204.

[15] Henry P. Smith, and Emerald V. Dechant, Psychology in Teaching Reading. (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1961), p. 89.

[16] Arthur W. Schoeller, op. cit., p. 192.

TABLE 15

PARTIAL CORRELATION
HYPOTHESIS ONE

Variable one	Variable two	Partial r	Significance
Stanford Reading Test	Comprehension of Conjunctions Test	.2415	.02

The Cloze Comprehension of Conjunctions Test was the second technique for measuring comprehension of conjunctions. The test consisted of three passages; one passage contained a large number of conjunctions; the second passage contained half as many conjunctions; and the third passage contained no conjunctions. Three one way analyses of variance were computed to determine the relationship between the subject's achievement on the three types of cloze passage. Data from computer program BMDO3R and the formula for analysis of variance were used to compute these analyses of variance. The f score for the analysis of variance between passages using half as many conjunctions and the passage with no conjunctions was 35.93 which significant at the .001 level. The f score for the analysis of variance between the passages using a high number of conjunctions and no conjunctions was 61.83 which is significant at the .001 level. The f score for the analysis of variance between passages using half as many conjunctions and a high number of conjunctions was 8.75 which is significant at the .001 level.

The f score for each analysis of variance was significant at the .001 level; however, the scores for the passages with half as many conjunctions and no conjunctions, as well as the one for a high number of conjunctions and no conjunctions were much higher than the f score for the average conjunctions and the high conjunctions passages. Hypothesis one, then, is also supported by the results of this analysis, using the Cloze Comprehension of Conjunctions Test as the criterion. This data is summarized in Table 16.

TABLE 16

THE CLOZE COMPREHENSION OF CONJUNCTIONS TEST
HYPOTHESIS ONE

Passages	f score	Significance
High conjunctions and no conjunctions	61.83	.001
No conjunctions and half as many conjunctions	35.93	.001
High conjunctions and half as many conjunctions	8.75	.001

Hypothesis one must be accepted. There is a significant relationship between a subject's ability to identify the relationships that conjunctions signal and his reading comprehension. The analysis of results from the Comprehension of Conjunctions Test, and the Stanford Reading Achievement Test, as well as the results of the Cloze

Comprehension of Conjunctions Test support the significance of this relationship.

Analysis of the Difficulty of Various Conjunctions

The significance of difference in the difficulty of various types of conjunctions is explored in hypothesis two. Data from the Comprehension of Conjunctions Test is used to investigate this hypothesis.

In order to arrive at the significance of difficulty for items on the Comprehension of Conjunctions Test, the binomial test was used. This test revealed a level of probability which indicated the significance of difficulty or ease for the items (see Table 17). Through this analysis it was found that twenty of the sixty-three items were significantly difficult for the subjects. The difficulty level ranged from .916 to .558, and the significance of difficulty ranged from .0000001 to .1334885. Eleven items were found to be significantly easy for the subjects. The difficulty level for these items ranged from .084 to .316, and the significance of difficulty ranged from .0000001 to .0003369.

The twenty difficult items represent ten different conjunctions. The conjunctions which were significantly difficult for the subjects were, when, so, but, or, where, while, how, that, than, and if. The eleven significantly easy items represent four different conjunctions, but, and, for, and as. The remaining thirty-two items on this test fall in a middle range and are neither significantly easy or significantly difficult. This table is organized by the rank order of difficulty of items. Rank one is the most difficult, and rank sixty-three is the most easy item.

TABLE 17

HIERARCHY OF DIFFICULTY OF ITEMS COMPREHENSION OF CONJUNCTIONS TEST

Rank	Item	Conjunction	Difficulty Level	Probability of** Difficulty
Difficult Items				
1.	46	when (while)	.916	.0000001
2.	54	so	.821	.0000001
3.	12	but (other than)	.800	.0000001
4.	49	when (though)	.768	.0000001
5.	23	or	.737	.0000003
6.	47	where	.737	.0000003
7.	61	so	.737	.0000003
8.	58	while	.726	.0000034
9.	48	how	.726	.0000034
10.	31	that	.684	.0001591
11.	22	or (synonymous)	.674	.0003399
12.	26	if (on condition that)	.642	.0034760
13.	62	where	.632	.0034760
14.	27	so	.621	.0035551
15.	42	but	.621	.0035551
16.	63	while	.589	.1334995
17.	30	how	.579	.1334995
18.	24	than	.568	.1334995
19.	19	but	.558	.1334995
20.	40	but	.558	.1334995
Middle Range of Difficulty				
21.	59	when (at the time)	.547	ns***
22.	57	but (unless)	.537	ns
23.	51	how	.537	ns
24.	50	because	.526	ns
25.	18	and (again)	.526	ns
26.	15	but	.495	ns
27.	9	neither	.484	ns
28.	34	why	.484	ns
29.	52	neither	.474	ns
30.	56	but (other than)	.474	ns

*Items are ranked in descending order of difficulty—1. is most difficult.

**P = .05

***ns = not significant

TABLE 17 (CONTINUED)

HIERARCHY OF DIFFICULTY OF ITEMS COMPREHENSION OF CONJUNCTIONS TEST

Rank	Item	Conjunction	Difficulty Level	Probability of Difficulty
31.	14	or	.463	ns
32.	11	yet	.436	ns
33.	25	than	.432	ns
34.	28	though	.432	ns
35.	43	if (whether)	.432	ns
36.	53	either	.432	ns
37.	33	where	.421	ns
38.	44	while	.421	ns
39.	13	while	.411	ns
40.	45	though	.411	ns
41.	36	either	.400	ns
42.	41	yet	.389	ns
43.	32	when	.389	ns
44.	1	and (in addition to)	.379	ns
45.	55	and	.379	ns
46.	35	because	.379	ns
47.	29	while	.379	ns
48.	7	as (while)	.368	ns
49.	37	now	.368	ns
50.	38	since	.368	ns
51.	39	and	.358	ns
52.	60	since (because)	.358	ns
Easy Items				
53.	30	but	.316	.0003369
54.	8	for	.263	.0000054
55.	6	and	.242	.0000003
56.	2	and	.242	.0000003
57.	21	as	.211	.0000001
58.	4	and	.200	.0000001
59.	10	and	.189	.0000001
60.	16	and	.179	.0000001
61.	17	and	.168	.0000001
62.	5	for	.126	.0000001
63.	3	and	.084	.0000001

Chi square was used to analyze the significantly difficult items and the significantly easy items to determine whether a hierarchy existed among the significantly difficult and the significantly easy items. The items were compared with each other statistically to determine whether one item was significantly more difficult or easy than the other items on the list. Among the difficult conjunctions when was significantly more difficult than the other difficult conjunctions, at the .001 level. So was significantly more difficult than all other conjunctions except but at the .001 level. But (meaning other than) was significantly more difficult than all other conjunctions except so at the .001 level. Or was significantly more difficult than all other conjunctions except when, so, but, and where, at the .01 level. Where was significantly more difficult than all other conjunctions except when, so, but, and or at the .01 level. So is significantly more difficult than all other conjunctions except when, but, or, and where, at the .01 level. This data is compiled in Table 18.

Among the significantly easy items on the Comprehension of Conjunctions Test, and was significantly more easy than all other conjunctions, at the .001 level. For was significantly more easy than all conjunctions except and at the .001 level. As was significantly more easy than all other conjunctions except and and for at the .005 level. This data is found in Table 19.

Hypothesis two, then, must also be accepted as the analysis of data indicates that there is a significant difference in the difficulty of various conjunctions. There are hierarchies of difficulty in understanding of conjunctions.

TABLE 18

HIERARCHY OF DIFFICULTY AMONG DIFFICULT ITEMS

Rank*	Item	Conjunction	Chi Square	Probability**
1.	46	when	35.73	.001
2.	54	so	23.48	.001
3.	12	but	20.47	.001
4.	49	when	10.94	.001
5.	23	or	6.64	.01
	47	where	6.64	.01
	61	so	6.64	.01
6.	58	while	2.55	ns***
	48	how	2.55	ns
7.	31	that	1.90	ns
8.	22	or	1.90	ns
9.	26	if	1.80	ns
10.	62	where	1.80	ns
11.	27	so	1.71	ns
	42	but	1.71	ns
12.	63	while	.68	ns
13.	30	how	.27	ns
14.	24	than	.19	ns
15.	19	but	00	ns
	40	but	00	ns

*Rank in descending order of difficulty - item 1. is most difficult or most easy.

**p = .05

***ns = not significant

TABLE 19

HIERARCHY OF DIFFICULTY AMONG EASY ITEMS

Rank*	Item	Conjunction	Chi Square	Probability**
1.	3	and	11.59	.001
2.	5	for	11.21	.001
3.	17	and	11.45	.001
4.	16	and	15.00	.001
5.	10	and	25.46	.001
6.	4	and	21.00	.001
7.	21	as	7.4	.005
8.	2	and	4.5	.025
	6	and	4.5	.025
9.	8	for	15.0	.001
10.	20	but	0000	ns***

*Rank in descending order of difficulty - item 1. is most difficult or most easy.

**p = .05

***ns = not significant

The Relationship Between Demographic Variables and Comprehension of Conjunctions

The third hypothesis of this study was that a significant relationship existed between understanding conjunctions and the demographic variables of sex, socioeconomic level, and intelligence. The Cloze Comprehension of Conjunctions Test, the Comprehension of Conjunctions Test, and The Pintner Test of Mental Ability were used to collect the data necessary to examine this hypothesis. The computer program provided eta coefficients for the demographic variables on these three measures.

Sex and the Comprehension of Conjunctions:

Girls understood conjunctions better than boys on every measure; however, the difference in comprehension of conjunctions was significant on only one measure. The correlation coefficient for the Cloze Comprehension of Conjunctions Test written with a high number of conjunctions was .300000 which is significant at the .01 level. The correlation coefficient for the Comprehension of Conjunctions Test was .03388 which was not significant. The correlation coefficient for the Cloze Comprehension of Conjunctions Test passages written with half as many conjunctions was .07244 which was not significant, and the correlation coefficient for the passage written with no conjunctions was .08675 which was not significant. This data is compiled in Table 20.

TABLE 20

SEX AND COMPREHENSION OF CONJUNCTIONS

Measure	Correlation Coefficient	Significance
Comprehension of Conjunctions Test	0.03388	ns*
Cloze Comprehension of Conjunctions High Conjunctions	0.30000	.01
Cloze Comprehension of Conjunctions Half Conjunctions	0.07244	ns
Cloze Comprehension of Conjunctions No Conjunctions	0.08675	ns

*ns = not significant

Socioeconomic Level and Comprehension of Conjunctions:

Socioeconomic level was correlated with the four measures of comprehension of conjunctions. The correlation coefficient for socioeconomic level and The Comprehension of Conjunctions Test was .5195 which is significant at the .001 level. The correlation coefficients for socioeconomic level and The Cloze Comprehension of Conjunctions Test passages are as follows: the passage with high conjunctions, .3967, which is significant at the .001 level; the passage with half as many conjunctions, .4141, which is significant at the .001 level; and the passage written with no conjunctions, .4931, which is significant at the .001 level. Thus, it is apparent that there is a high positive correlation between socioeconomic level and comprehension of conjunctions. Subjects at high socioeconomic levels comprehended conjunctions better than students at the average socioeconomic level, and average socioeconomic level subjects comprehended better than subjects at the low socioeconomic level. This data is compiled in Table 21.

TABLE 21

SOCIOECONOMIC LEVEL AND COMPREHENSION OF CONJUNCTIONS

Measure	Correlation Coefficient	Significance
Comprehension of Conjunctions Test	.5196	.001
Cloze Comprehension of Conjunctions High Conjunctions	.3967	.001
Cloze Comprehension of Conjunctions Half Conjunctions	.4141	.001
Cloze Comprehension of Conjunctions No Conjunctions	.4931	.001

Intelligence and Comprehension of Conjunctions:

The intelligence quotients of the subjects were correlated with the four measures of comprehension of conjunctions. The correlation coefficient for intelligence and The Comprehension of Conjunction Test was .6446 which is significant at the .001 level. The correlations between intelligence and the Cloze Comprehension of Conjunctions Test passages are as follows: the passage with a high number of conjunctions, .6364, which is significant at the .001 level; the passage with half as many conjunctions, .6747, which is significant at the .001 level; and the passage with no conjunctions, .4931, which is significant at the .001 level. Thus, there is a high positive relationship between intelligence and comprehension of conjunctions. As the intelligence quotient increases, the comprehension of conjunctions increases. This data is compiled in Table 22.

TABLE 22

INTELLIGENCE AND COMPREHENSION OF CONJUNCTIONS

Measure	Correlation Coefficient	Significance
Comprehension of Conjunctions Test	.6446	.001
Cloze Comprehension of Conjunctions Test		
High Conjunctions	.6364	.001
Half Conjunctions	.6747	.001
No Conjunctions	.4931	.001

Hypothesis three may also be accepted; there is a significant relationship between demographic variables and comprehension of conjunctions. The relationship between socioeconomic level and comprehension of conjunctions is a high positive relationship which is significant on every measure. The relationship between intelligence and comprehension of conjunctions is also a high positive relationship which is significant on every measure. The relationship between sex and comprehension is significant on only one measure; however, girls do achieve higher than boys on every measure. The one measure which was statistically significant in correlating comprehension of conjunctions and sex was the Cloze Comprehension of Conjunctions Test passage with a high number of conjunctions.

Summary

The general objective of this study was to determine if an understanding of various conjunctions was related to reading comprehension. Three hypotheses were explored in relation to this objective.

Four instruments were used to collect data relating to a stratified random sample of fourth grade students. In addition to the test scores, data was collected regarding the sex, socioeconomic level and intelligence of each subject. Examination of the test scores from the four instruments shows a wide variability of student response on each measure.

Hypothesis one, there is a significant relationship between a subject's ability to identify the relationships that conjunctions signal and reading comprehension. The correlation between a subject's ability to identify the relationships that conjunctions signal and his reading comprehension was significant at the .02 level as measured by The Comprehension of Conjunctions Test and the Stanford Reading Achievement Test with intelligence partialed out. The Cloze Comprehension of Conjunctions Test was also used to explore this relationship. The analyses of variance for the difference in achievement in passages written with a high number of conjunctions, passages written with half as many conjunctions, and a passage written with no conjunctions were all significant at the .001 level.

Hypothesis two, there is a significant difference in the difficulty of various conjunctions. The difference in difficulty of comprehension of various conjunctions was found significant. The item analysis, binomial test, and the chi square provided indices of relative difficulty for various conjunctions.

Hypothesis three, there is a significant difference between comprehension of conjunctions by boys and girls: there is a significant difference in comprehension of conjunctions at various socioeconomic levels; and there is a significant difference in comprehension of conjunctions at various levels of intelligence. Data collected in this investigation indicates that there is a significant relationship between each of the demographic variables and comprehension of conjunctions. However, girls were significantly higher than the boys on only one measure.

This chapter has described the collection and analysis of data. The following chapter will present the conclusions based upon the data presented and discussed in this chapter.

CHAPTER V

SUMMARY AND CONCLUSIONS

The reading skills of American children have long been of concern to educators and public alike. Commissioner of Education, Allen heightened this concern with his recent "right to read" statement. The recent requests for proposals sent out by the United States Office of Education, focus on the various dimensions of reading in an effort to determine ways of extending "the right to read" to every child. Reading comprehension is chief among reading problems that educators and researchers must solve. Nila Banton Smith states the problem of understanding the reading process eloquently in this quotation, "we chopped down and cleared away the large virgin trees, but perhaps some of the humble shrubs or creeping vines or fragile mosses may hold even more significance for us than the strikingly obvious, first-sight timbers."[1] This investigation has been an effort to explore what might be termed one of the creeping vines in relation to reading.

In view of the concern and need for understanding reading comprehension, this study was undertaken as an effort to determine if understanding of conjunctions was related to reading comprehension.

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[1] Smith, op. cit., p. 426.

Three hypotheses gave direction to the study which was conducted with a stratified random sample of fourth grade students. The overarching purpose was the exploration of the relationship between a subject's understanding of conjunctions and his reading comprehension. Another purpose was to explore the difference in the difficulty of various conjunctions. The third purpose was related to the relationship between understanding conjunctions and the demographic variables of socioeconomic level, sex, and intelligence. The three hypotheses investigated in this study were:

1. There is a significant correlation between a subject's ability to identify the relationships that conjunctions signal and his reading comprehension.
2. There is a significant difference in the difficulty of various types of conjunctions, for example and is easier to understand than is for.
3. There is a significant relationship between understanding conjunctions and demographic variables of sex, socioeconomic level, and intelligence.

Test Construction

Since this study was designed for the purpose of investigating the relationship between reading comprehension and comprehension of conjunctions, instruments were required to measure these variables. A multiple-choice test, The Comprehension of Conjunctions, was one of the instruments designed to investigate understanding of conjunctions. In order to develop this instrument it was necessary to identify the words which function as conjunctions and the conjunctions' most frequent usage. The following words were those identified as conjunctions used most frequently through the fourth grade: *and*, *as*, *because*, *but*, *either*, *for*, *if*, *how*, *now*, *neither*, *nor*, *now*, *or*, *since*, *so*, *than*, *that*, *though*, *where*, *when*, *while*, *why* and *yet*. Working definitions were developed by the principal investigator for the conjunctions selected to study. Multiple choice test items were developed on the basis of these definitions.

The original multiple choice test was composed of fifty items with four response options. It was administered in two fourth grade intact classrooms with a total of 60 subjects. The purpose of the preliminary administration of the test was to establish validity of the test and of the individual test items. An item analysis was performed to establish validity of the items, this revealed that two items had negative discrimination powers; therefore, they were eliminated from the test. The Kuder-Richardson formula 21 yielded a reliability coefficient of .88 for the preliminary test. The test was extended to sixty-three items in an effort to raise the reliability of the instrument. This multiple choice instrument of sixty-three items constituted the Comprehension of Conjunctions Test used for the investigation. The Kuder-Richardson formula 20 yielded a reliability coefficient of .898, and the Kuder-Richardson formula 21 yielded a reliability coefficient of .880 for the final instrument.

The Cloze Comprehension of Conjunctions Test was developed as a second instrument for measuring comprehension of conjunctions. A cloze technique consists of replacing every fifth word in a reading passage with a blank of standard length. The test consisted of three 200 word passages; one passage was written with a high number of conjunctions, the second passage was written with half as many conjunctions, and the third passage was written with no conjunctions. Sentence length, vocabulary load, and prepositional phrases of these passages were controlled using the Lorge formula, so that the problem the subjects encountered in completing the passages was the difference in number of conjunctions.

Two standardized tests were also used to collect data. The Stanford Achievement Test in reading was used to measure reading comprehension achievement. Mental ability was measured with the Pintner Mental Ability Test.

The Collection and Treatment of Data

A stratified random sample of subjects was used for this study because previous research indicates that various socioeconomic levels may have different strengths in language abilities. Both Robertson[2] and Marcus[3] found that achievement varied with socioeconomic level. The sample included ninety-five fourth grade students selected randomly from a fourth grade student population at three socioeconomic levels in Mansfield, Ohio Public City Schools.

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[2] Robertson, *op. cit.*, p. 285.

[3] Marcus, *op. cit.*, p. 13.

The four instruments were administered to subjects by four graduate students majoring in elementary education. Administration took place in small group sessions located in the elementary schools attended by the subjects. The Comprehension of Conjunctions Test and The Cloze Comprehension of Conjunctions Test were untimed instruments as they were designed to measure power of comprehension of conjunctions. The Stanford Achievement Test and The Pintner Mental Ability Test were administered according to the standardized instructions which accompany the instruments. The tests were administered and scored by four graduate students assisted by two undergraduate students, all of whom were majoring in elementary education. After the tests were scored the scoring was rechecked for accuracy.

Analysis of the data was accomplished through the use of the following statistical procedures. Item analysis was used to check the reliability and validity of the test. Item analysis was also used to identify difficult test items and to analyze student achievement on test items. Kuder-Richardson formulas 20 and 21 were used to check the internal reliability of the test. A partial correlation coefficient was computed between reading comprehension and comprehension of conjunctions while controlling the effects of intelligence. Three one-way analyses of variance were computed to test the significance of variations in student achievement on the three Cloze Comprehension of Conjunctions Test passages. The significance of difficulty for test items on The Comprehension of Conjunctions Test was analyzed through computation of the binomial test and chi square. Eta correlation coefficients were computed to assess the relationships between the demographic variables and comprehension of conjunctions.

Computer program BMDO3R was programmed by the Computer Center at The Ohio State University. This computer program provided the correlation coefficients and the basic data required for computation of the analyses of variance and the partial correlation coefficient. The item analysis and Kuder-Richardson formulas 20 and 21 were programmed for IBM by the Evaluation and Measurement Center at The Ohio State University. This program provided data for computing the binomial test and the chi square.

Findings and Conclusions

This section has a twofold purpose one of which is to present the findings and conclusions related to each of the three hypotheses. The second purpose is to discuss the implications of the study. The findings of this study are summarized in Table 23.

Findings and Conclusions for Hypothesis I

The objective of hypothesis one is to determine whether a significant correlation exists between a subject's ability to identify the relationships that conjunctions signal and his reading comprehension. A partial correlation coefficient, controlling for intelligence was computed between comprehension of conjunctions and reading comprehension. It yielded a correlation coefficient of .2415 which is significant

TABLE 23

SUMMARY OF RESULTS

Hypothesis	Partial Correlations	Analysis of Variance	Chi Square	Eta Correlation	Probability*
I. Conjunctions and Comprehension:					
Comprehension of Conjunctions Test	.415				.02
Cloze Comprehension of Conjunctions Test					
High Conj. and None		61.83			.001
No Conj. and Half		35.93			.001
High Conj. and Half		8.75			.001
II. Hierarchy of Difficulty					
Difficult Conjunctions			35.73 to .19		.001 to ns**
Middle Conjunctions			00		ns
Easy Conjunctions			11.59 to 4.5		.001 to ns
III. Demographic Variables					
Sex					
Comprehension of Conjunctions Test				.03388	ns

*P = .05

**ns = not significant

TABLE 23 (CONTINUED)

SUMMARY OF RESULTS

Hypothesis	Partial Correlation	Analysis of Variance	Chi Square	Eta Correlation	Probability
Cloze Comprehension of Conjunctions Test					
High Conjunctions				.30000	.01
Half Conjunctions				.72444	ns
No Conjunctions				.08675	ns
Socioeconomic					
Comprehension of Conjunctions Test				.5196	.001
Cloze Comprehension of Conjunctions Test					
High Conjunctions				.3967	.001
Half Conjunctions				.4141	.001
No Conjunctions				.4931	.001
Intelligence					
Comprehension of Conjunctions Test				.6446	.001
Cloze Comprehension of Conjunctions Test					
High Conjunctions				.6347	.001
Half Conjunctions				.6747	.001
No Conjunctions				.4931	.001

at the .02 level. Thus, hypothesis one was supported in this part of the study, there is a significant relationship between reading comprehension and comprehension of conjunctions.

Hypothesis one was further explored through the use of the Cloze Comprehension of Conjunctions Test. Analyses of variance were computed to analyze this measure. The analysis of variance between the passage using a high number of conjunctions and the passage containing no conjunctions was 61.83 which is significant at the .001 level. The analysis of variance between the passage using half as many conjunctions and the passage using no conjunctions was 35.93 which is significant at the .001 level. The analysis of variance for the passage containing a high number of conjunctions and the passage containing an average number of conjunctions was 8.75 which is significant at the .001 level. Again, hypothesis one was supported in this study.

The relationship indicated by the correlation between reading comprehension and understanding of conjunctions may be because conjunctions related ideas. The relationship of ideas may be difficult for the fourth grade student to understand. Flesch calls connectors, "word bridges."[4] He also says that "connectors tell the reader exactly in what way the ideas are tied together." Fourth grade students may be having difficulty understanding how conjunctions tie ideas together.

The correlation between reading comprehension and understanding of conjunctions also suggests that perhaps instruction is required in the meaning and usage of conjunctions. Perhaps this instruction should become a part of reading instruction for children at the fourth grade or prior to fourth grade since the words investigated in this study were most frequently used through the fourth grade level.

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[4] Flesch, op. cit., p. 57.

The analyses of variance between the three Cloze Comprehension of Conjunctions Test passages suggests that the number of conjunctions in a passage is a factor in readability. One explanation for the difference may be that when conjunctions are not used ideas may be tied together in a more direct fashion, making comprehension easier. Flesch says that the "neatest" way of tying words together is to use no connecting words whatsoever.[5] For example, "The game must stop. The boys have to work." In this example the word because is not needed. The reader understands because in this situation without it being said. The sentences show the relationship of ideas directly. When examining the Cloze Comprehension of Conjunctions Test passage written with no conjunctions, it appears that the writer repeated nouns and verbs more frequently when conjunctions were not used. This fact seemed to make the meaning more direct.

Since the number of conjunctions in a passage is related to readability of the passage, the possibility of making a count of conjunctions a part of readability formulas should be investigated. This also suggests that readability of instructional materials could be improved through controlling the number of conjunctions used.

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[5] Ibid.

Findings and Conclusions for Hypothesis II

The objective of hypothesis two is to determine whether there is a significant difference in the difficulty of various types of conjunctions. The binomial test, chi square, and item analysis were used to analyze the data related to this hypothesis. The item analysis and the binomial test were computed to establish which items were significantly difficult and significantly easy for the subjects on the Comprehension of Conjunctions Test.

Thirteen of the sixty-three items were established as significantly difficult for the subjects in this study. These thirteen items represent nine different conjunctions. The difficulty level of these significantly difficult items ranges from 1916 to .558 and the range of significance was from .0000001 to .1334994. The most difficult conjunctions according to this analysis were: when, so, but, or, where, while, how, that, and if. Among the difficult conjunctions when was significantly more difficult than the other difficult conjunctions, at the .001 level. So was significantly more difficult than all the other conjunctions except but, at the .001 level. But was significantly more difficult than all other conjunctions except so at the .001 level. Or was significantly more difficult than all other conjunctions except so at the .001 level. Or was significantly more difficult than all other conjunctions except when, so, but and where at the .01 level. Where was significantly more difficult than all other conjunctions except when, so, but, and or at the .01 level. So was significantly more difficult than all other conjunctions except when, but, or, and where at the .01 level.

Eleven items were found to be significantly easy for the subjects. The difficulty level of these items ranged from 1084 to .316, and the significance of difficulty ranged from .0000001 to .0003369. The eleven significantly easy items represent four different conjunctions, how, and, for, and as. Among the easy items on the Comprehension of Conjunctions Test, and was significantly more easy than all conjunctions except and at the .001 level. As was significantly more easy than all other conjunctions except and and for at the .05 level. Thus, the hierarchy of difficulty among the difficult and easy items on this test, and the analysis of this hierarchy, represents support for hypothesis two.

Discussion of Findings Regarding Hypothesis II

Among the significantly difficult conjunctions, the conjunctions which signal incorporation seem to be chief among those causing difficulty. The most difficult conjunctions, when, where, that, how, and if were all conjunctions of incorporation. Incorporation required relating or uniting two entities; therefore, the relationship between two entities may have been a problem for subjects in this study.

The conjunctions, but and while present contrasting relationships to the reader. He must hold one idea in mind and contrast it with another. Or is a conjunction of alternation which causes the reader to hold ideas in mind and contrast them. The reader must mentally move back and forth between ideas. Thus, it appears that holding ideas in mind in order to contrast them was difficult for the fourth grade students in this study.

Among the easy conjunctions it appears that the relationship of simple addition was most easy for the subjects. And represents this relationship which is one in which the content or ideas added to the sentence by and does not change the ideas or content preceding and; therefore, the reader does not have to hold ideas in mind. How is an easy item which represented a relationship of incorporation, but the material incorporated did not require the reader to hold previous information in mind as the incorporated information did not change the information preceding how. For was also used in the sense of adding information without changing previous information. As was the only one of the easy conjunctions which required the reader to hold information in mind. As may have been easy for the subjects in this study because it required them to think of similarities, while the difficult conjunctions required the subject to think of differences. As required the subject to think of similarities because as signals a relationship of comparison.

In comparing the problems presented by the difficult and easy conjunctions it seems that to hold ideas in mind and to relate them is a difficult operation for the reader in this study. The conjunctions which did not require the reader to hold information in mind were easier for these subjects. It also seems easier for the subjects to think of similarities between ideas or information than to think of differences. This difficulty may also indicate that the subjects did not know which words in the sentence were most significant in working out the meaning of the sentence. They may not have assigned enough importance to certain conjunctions when these conjunctions were functioning in a fashion which could change meaning. These findings may indicate that the relationship of simple addition and contrast are those which are easiest to learn while the more difficult relationships in this study require longer to develop. Because certain relationships require longer for development and are more difficult, they may require instruction as a part of the developmental reading program.

Findings and Conclusions for Hypothesis III

The objective of hypothesis three was investigation of the relationship between understanding conjunctions and the demographic variables of sex, socioeconomic level, and intelligence. In order to explore this relationship the comprehension of conjunctions measures were correlated with the demographic variables.

The relationship between comprehension of conjunctions and sex is not clear cut. Girls comprehend conjunctions better than boys on all measures; however, the difference between boys and girls was statistically significant on only one measure. The girls were significantly higher than boys on the Cloze Comprehension of Conjunctions Test written with a high number of conjunctions, the correlation was .30000 which is significant at the .01 level. The correlation for the Comprehension of Conjunctions Test was .03388. The correlations for the Cloze Comprehension of Conjunctions Test passages with half as many conjunctions was .07244, and for the passage with no conjunctions it was .08676.

This difference in significance may be due to the fact that the Cloze Comprehension of Conjunctions Test written with a high number of conjunctions was the most difficult of the three cloze tests. It may be that as the test became more difficult the girls' achievement became more significant. The more difficult test may have also frustrated the boys more and thus pushed their achievement down as it became more difficult. The more difficult test may have provided more opportunity for the student who comprehends well to surpass the student who does not comprehend well.

Correlating socioeconomic level and the four measures of comprehension of conjunctions provided the following correlations: Comprehension of Conjunctions Test, .5196 which is significant at the .001 level; the Cloze Comprehension of Conjunctions Test with a high number of conjunctions, .2967, significant at the .001 level; Cloze Comprehension of Conjunctions Test with half as many conjunctions, .4141, significant at the .001 level; and the Cloze Comprehension of Conjunctions Test with no conjunctions, .4947 which is significant at the .001 level. There is a high positive correlation between socioeconomic level and comprehension of conjunctions. Therefore, children at high socioeconomic levels understand conjunctions better than children at average socioeconomic levels, and children at average socioeconomic levels understand conjunctions better than children at low socioeconomic levels. This finding is supported by past research by Marcus[6] which indicates that children at different socioeconomic levels achieve in different ways. This study is further supported by the Marcus[7] study which suggests that lower socioeconomic level children have more difficulty understanding relationships.

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[6] Marcus, op. cit., p. 13.

Correlating the measures of comprehension of conjunctions with mental ability provides the following correlation coefficients: the Comprehension of Conjunctions Test, .6446, significant at the .001 level; the Cloze Comprehension of Conjunctions Test with a high number of conjunctions, .6364, significant at the .001 level; the Cloze Comprehension of Conjunctions with half as many conjunctions .6747, significant at the .001 level; and the Cloze Comprehension of Conjunctions Test with no conjunctions, .6125, significant at the .001 level. The high positive relationship between intelligence and comprehension of conjunctions indicates that as intelligence increases so does comprehension of conjunctions. This finding is supported by previous research which indicates that reading comprehension is related to intelligence.[8]

Discussion of Findings Regarding Hypothesis III

Each of the three demographic variables was positively related with comprehension of conjunctions; therefore, hypothesis three is supported by the findings of this study. Intelligence and socioeconomic level were significantly related with comprehension of conjunctions; while sex was positively related with comprehension of conjunctions this relationship was significant only in one aspect, the Cloze Comprehension of Conjunctions Test passage written with a high number of conjunctions.

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[7] _Ibid._

[8] Schoeller, _op_. _cit_., p. 199.

Summary of the Relationships Between Comprehension and Understanding of Conjunctions

Hypothesis one is accepted. There is a significant relationship between reading comprehension and understanding conjunctions. A partial correlation computed between the Comprehension of Conjunctions Test and the reading comprehension score from the *Stanford Reading Achievement Test* was significant with a probability of $p < .02$. An analysis of variance was computed for each of the scores on the Cloze Comprehension of Conjunctions Tests, one written with a high number of conjunctions, the second written with half as many conjunctions, and the third written with no conjunctions. The analyses of variance were all highly significant with a probability of $p < .001$.

Hypothesis two is also accepted. Nine different conjunctions were found to be significantly difficult, and four different conjunctions were found to be significantly easy. The significance of difficulty ranged from p .000001 to .1334995. The significance of difficult conjunctions ranged from p .000001 to .0003369. The conjunctions found to be most easy were *when*, *so*, *but*, *or*, *where*, *while*, *how*, *that*, and *if*. The easiest conjunctions were *and*, *how*, *for*, and *as*.

Hypothesis three, is also accepted. The correlation coefficients between sex and the measures of comprehension of conjunctions show that girls achieved higher than boys on these measures; however, the difference in achievement was significant on only one measure, the Cloze Comprehension of Conjunctions Test written with a high number of conjunctions. The probability for this measure was $p. < .01$. There was a high positive relationship between socioeconomic level and all measures of comprehension of conjunctions. The probability on every measure was $p. < .001$. The correlation between comprehension of conjunctions and intelligence quotient was also a high positive correlation with probability of $p. < .001$ on every measure.

Implications for Practice and Research

Since this study established a relationship between reading comprehension and understanding of conjunctions it appears that the developmental reading program should give more attention to systematic teaching of conjunctions and the relationships they signal. The conjunctions which have been found to be significantly difficult should be introduced with instruction which will enable students to use these words with precision and understanding.

It also appears that more attention should be given to the role of conjunctions in the readability of material. Currently, five basic types of control are used in preparing reading materials: number of words, sound-letter associations, interest, literary, and structure of language. This study suggests that conjunctions may play a role in the difficulty of reading materials. Results of this study indicate that fourth grade children had more difficulty reading materials written with a high number of conjunctions, and with half as many conjunctions when compared with a passage written with no conjunctions; therefore, controlling the number of conjunctions in written content would apparently aid in controlling readability of content.

The findings of this study provide indications for improving instruction of disadvantaged students in the area of reading comprehension. Comprehension is a particular problem for these students. Teachers in the past have assumed that disadvantaged students were inattentive, while this study indicates that they have difficulty understanding relationships. Instruction regarding the relationships signaled by conjunctions may improve comprehension for these students.

Greater individualization of instruction is suggested by the findings in this study. Since children with lower intelligence test scores were lower in comprehension of conjunctions, they may require assistance in understanding conjunctions and the relationships they signal. Although the difference between boys and girls is not so clear-cut there are indications that boys may lag behind girls in understanding conjunctions. Therefore, boys may require additional assistance in developing understanding of conjunctions.

Since this study has extended knowledge in terms of recognizing the "smaller" linguistic factors in relationship to comprehension, perhaps words such as prepositions are important. Other linguistic factors involved in sentence construction such as punctuation may warrant greater attention than they have been granted in the past.

The methodology used in this study may be useful in future studies. The tests used, and the approach of using both a multiple choice test and cloze passages written with varying numbers of conjunctions may prove fruitful modes of approaching the problem of assessing comprehension. Evaluation of comprehension has long been a problem, and this problem is underscored by the outcomes of the current study since this study further indicates the complexity of reading comprehension.

Since certain conjunctions were more difficult for the subjects in this study, an interesting follow-up study would be one which relates written and spoken use of conjunctions. For example, do students use the more difficult conjunctions in their own speech, and unsupervised writing?

Chomsky[9] has proposed that the syntactic component of the sentence must generate and interrelate deep and surface structure. Since conjunctions are structure words which relate to both syntax and semantics, and the outcomes of this study indicate that conjunctions are difficult for some subjects to understand, a study of the relationship of conjunctions to deep and surface structure could be a fruitful area of investigation.

The complexity of reading comprehension, and the constellation of skills which comprise this ability are reaffirmed by this study.

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[9] Chomsky, op. cit., p. 49.

This study shows that the "creeping vines" and "fragile mosses" suggested by Smith[10] do hold significance for understanding reading comprehension.

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[10] Smith, op. cit., p. 426.

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APPENDIX

TABLE 2 CONJUNCTIONS

Fernald	Fries	Long	Strang	Whitehall	Mellon
also	and	and	and	and	moreover
although	also	but	or	but	also
and	nor	or	not	yet	furthermore
as	but	nor	but rather	as	besides
because	yet	both	sooner than	nor	in addition
both	then	not	as well as	or	nevertheless
but	therefore	either	nor	than	however
either	however	neither	because	for	although
ere	after	when	therefore	so	whereas
for	although	how	although	if	still
except	though	if	for	though	yet
forasmuch	as	after	nevertheless	while	accordingly
however	because	that	if	how	consequently
if	before	because	whether	that	thus
lest	for	therefore	after	what	hence
neither	how	nevertheless	before	when	therefore
nevertheless	if		since	where	
nor	like		so	which	
notwithstanding	provided		when	who	
or	since		whenever	why	
provided	so			else	
save	than			consequently	
seeing	that			hence	
since	unless			after	
so	until			because	
still	what			before	
than	when			provided	

TABLE 2 CONJUNCTIONS (CONTINUED)

Fernald	Fries	Robertson	Schuster	Whitehall	Fernald (Cont.)
that	where	although	and	providing	either-or
then	whether	because	but	since	if-then
therefore	which	if	for	supposing	neither-nor
though	while	so	or	unless	no-nor
till	who	that	nor	until	so-as
unless	why	when	yet	whence	such-as
until		where	so	whether	though-yet
when		that	either-or	whither	whether-or
whence		which	neither-nor	also	
where		who	both-and	furthermore	
whereas		and	not (only)	moreover	
whereat		but	but (also)	however	
whereby		for		nevertheless	
wherefore		yet		such as	
wherein		however		or else	
whereinsoever		thus		other than	
whereinto		"absent" that		otherwise	
whereof				and so	
whereto				so that	
whereupon				therefore	
wherever				although	
wherewith				for all	
whether				however	
while				in that	
whiter				so that	
why				whatever	
although-yet					
as-as					
as-so					
both-and					

TABLE 3 VOCABULARY AND FREQUENCY OF USAGE

List	West	Thorndike	Rinsland	Dolch	Spache	Dale
Conjunctions						
after	4491 (7% as conj)	1a	1527 (1a1)	*	Level I-II (2.7)	*
and	106,064	1a	28823 (1a1)	*	Level I-II (2.3)	*
as	23,646 (14% as conj)	1a	1634 (1a1)	*	Level III (2.3)	*
because	2703 (80% as conj)	1a	1367 (1a2)	*	Level V (3.3)	*
before	4021 (28% as conj)	1a	635 (1a2)	*	Level IV (3.4)	*
but	18,917	1a	3,245 (1a1)	*	Level I-II (2.4)	*
either	1166 (70% as conj)	1b	44 (2a)			*
for	25,951 (12.1% as conj)	1a	5337 (1a1)	*	Level I-II (2.4)	*

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*Represents the word is included in this list.

Rinsland - 1a1 means the first one hundred of the first 500 of the first one thousand continues to 1a5.
1b1 means the first one hundred of the second five hundred of the first one thousand.

West - number represents frequency of occurrence in 5 Mill.

Thorndike - 1a represents in first 500 of 20,000 words. 2b represents second 500 of 20,000 words. 3a represents third 500 of 20,000 words.

TABLE 3 VOCABULARY AND FREQUENCY OF USAGE (CONTINUED)

List	West	Thorndike	Rinsland	Lolch	Spache	Dale
Conjunctions						
how	4063	1a	2953 (1a1)	*	Level III (2.6)	*
if	8046	1a	1580 (1a1)	*	Level IV (2.2)	*
neither...nor	1134 (68% as conj)	1b	21 (3a)			*
nor	1172	1b	24 (a2b)		Level VIII (4.1)	*
now	5667 (21% as conj)	1a	908 (1a1)	*	Level I-II (2.7)	*
otherwise	354 (39% as conj)	3a	4 (5b)			
since	1608 (34% as conj)	1a	114 (1b3)		Level VIII (4.3)	*
so	12350 (31% as conj)	1a	1580 (1a1)	*	Level I-II (3.1)	*
till-until	888 (65% as conj)	1a	226 (1a5)			
that	53794 (54% as conj)	1a	4881 (1a1)	*	Level I-II (2.3)	*
then	8138	1a	371 (1a3)	a	Level V (2.9)	*
though	2644	1a	92 (1b4)		Level VII (4.9)	
when	8044	1a	4130 (1a1)	*	Level III (2.4)	*

TABLE 3 VOCABULARY AND FREQUENCY OF USAGE (CONTINUED)

List	West	Thorndike	Rinsland	Dolch	Spache	Dale
Conjunctions						
where	3516 (11% as conj)	1a	774 (1a2)	*	Level I-II (2.3)	*
whether	1284	1b	25 (2b)			
which	17298 (0.6% as conj)	1a	675 (1a2)	*	Level IV (3.2)	*
yet	2,496 (62% as conj)	1a	218 (1a5)		Level VI-I (3.3)	*

TABLE 9

THE COMPREHENSION OF CONJUNCTIONS TEST
DISTRIBUTION OF TEST SCORES

Scores	Distribution of Scores
57-59	1
54-56	2
51-53	4
48-50	9
45-47	4
42-44	6
39-41	5
36-38	10
33-35	8
30-32	5
27-29	3
24-26	13
21-23	10
18-20	10
15-17	4
12-14	1
Total Subjects	95
Mean	33.12
Range	57-14

TABLE 10

CLOZE COMPREHENSION OF CONJUNCTIONS TEST DISTRIBUTION OF TEST SCORES

Scores % Correct	Passage High Conjunctions	Passage Half Conjunctions	Passage No Conjunctions
84-89		1	1
80-83			2
76-79		4	3
72-75		1	8
68-71		3	14
64-67	1	4	6
59-63	6	26	24
56-58	6	8	4
52-55	5	6	2
48-51	5	12	5
44-47	14	8	4
40-43	12	3	1
36-39	6	3	1
32-35	6	4	1
28-31	13	2	2
24-27	3	2	2
20-23	7	2	5
16-19		1	2
12-15	1	1	5
8-11	2	0	0
4-7	4	3	1
0-3	4	1	2
Total Subjects	95	95	95
Mean	36.98	51.03	53.48
S.D.	16.07	16.02	20.47
Range	64-0	85-0	83-0

TABLE 11

THE PINTNER MENTAL ABILITY TEST
DISTRIBUTION OF TEST SCORES

Score	Distribution
149-152	2
143-148	2
138-142	4
132-137	2
126-131	4
120-125	11
114-119	14
108-113	9
102-107	11
96-101	11
90-95	11
84-89	6
78-83	6
72-77	0
66-71	2
Total Subjects	95
Mean	108.85
S. D.	18.39
Range	154-67

TABLE 12

STANFORD READING ACHIEVEMENT TEST DISTRIBUTION OF TEST SCORES

Scores	Distribution of Scores
94-97	1
90-93	0
86-89	0
82-85	0
78-81	0
74-77	2
70-73	2
66-69	3
62-65	1
58-61	9
54-57	7
50-53	13
46-49	12
42-45	7
38-41	5
34-37	6
30-33	9
26-29	11
22-25	5
18-21	2
Total Subjects	95
Mean	45.29
S. D.	1.56
Range	95-21

TABLE 13

THE COMPREHENSION OF CONJUNCTIONS TEST ITEM ANALYSIS

Item	Discrimination Index	Difficulty Index	Total Correct
1	36.6	.379	62.1
2	29.3	.242	75.8
3	25.9	.084	91.6
4	29.5	.200	80.0
5	29.5	.126	87.4
6	55.6	.242	75.8
7	62.5	.368	63.2
8	32.9	.263	73.7
9	54.7	.484	51.6
10	4.4	.189	81.1
11	47.4	.463	53.7
12	8.3	.800	20.0
13	36.2	.411	58.9
14	58.7	.463	53.7
15	58.5	.495	50.5
16	40.7	.179	82.1
17	37.0	.168	83.2
18	50.9	.526	47.4
19	81.2	.558	44.2
20	47.6	.316	68.4
21	21.7	.211	78.9
22	27.8	.674	32.6
23	12.4	.737	26.3
24	51.0	.568	43.2
25	70.1	.432	58.8
26	77.4	.642	35.8
27	39.6	.621	37.9
28	43.7	.432	56.8
29	73.9	.379	62.1
30	47.3	.579	42.1
31	46.3	.684	31.6
32	40.2	.389	61.1
33	47.6	.421	57.9
34	55.0	.516	48.4
35	55.1	.379	62.1
36	62.5	.400	60.0
37	36.0	.368	63.2
38	43.6	.368	63.2
39	28.6	.358	64.2
40	47.2	.558	44.2
41	51.4	.389	61.1
42	27.8	.621	37.9
43	47.0	.432	56.8

TABLE 13 (CONTINUED)

THE COMPREHENSION OF CONJUNCTIONS TEST ITEM ANALYSIS

Item	Discrimination Index	Difficulty Index	Total Correct
44	24.8	.421	57.9
45	81.5	.411	58.9
46	22.2	.916	8.4
47	31.6	.737	26.3
48	43.0	.726	27.4
49	-10.4	.768	23.2
50	54.6	.526	47.4
51	58.5	.537	46.3
52	55.0	.474	52.6
53	58.8	.432	56.8
54	12.1	.821	17.9
55	51.4	.379	62.1
56	62.7	.474	52.6
57	43.3	.537	46.3
58	31.3	.726	27.4
59	32.2	.547	45.3
60	62.7	.358	64.2
61	31.2	.737	26.3
62	43.0	.632	36.8
63	47.0	.589	41.1

CLOZE TEST

Spring is a happy time because winter is gone. Spring comes when we _________given up. The robin _________yet snow is falling. _________sun nor flowers are _________,but we smell spring. _________days become sunny, though _________. The weather is lovely _________it lasts. The flowers _________because it rains. Flowers _________ and bloom. The flowers _________ bright as the sun. _________ sing and build nests. _________ are happy for spring. _________ and rain make the _________ green. This is how _________ comes.

Now that spring _________ here, children would rather _________ than eat. That is _________ they stay outside. They _________ outside because it is _________. Neither boys nor girls _________ play inside. Children go _________ only if it rains. The _________ is gone so they _________ marbles. They play ball _________ they were sliding. Boys _________ play ball or fly _________. This is how they _________. Girls jump rope, but _________ don't. Girls play "jacks" _________ boys run.

Children play _________ spring, but mother works. _________ may go or stay. _________ mother works and works. _________ must mop since the _________ are dirty. The wood _________ dusted, while the _________ are washed. Mother is _________ tired that she must _________. The house is cleaner than before.

March winds bring kite flying time. Children like to fly _________. K day is kite _________. Either boys or girls _________ fly kites. They fly _________ that they have made. _________ town gives children, string, _________, and paint. Sticks are _________ to make the kites _________. Each child takes any _________ paper he likes. It _________ be red, blue, green _________ yellow. Each child makes _________ paints his kite. He _________ it the way he _________ it. Each kite must _________ a very long string. _________ the kites are finished, _________ is time to fly.

First, _________ children march. They march _________ a field to fly _________. The children hold the _________ high for everyone to _________. It is noisy when _________ march. Everyone is happy.

_________ fly the kites, when _________ wind is just right. _________ wind must not be _________ strong. Strong winds break _________ strings. Each child runs _________ his kite will go _________. Men and women watch _________ kites. Soon the air _________ bright with kites. The _________ pulls them hard. One _________ string breaks, and the _________ flies away. Another kite _________ away. One big red _________ flies higher than the _________. It is the winning _________. The kite race is _________. The happy people go home, to wait for the next kite day.

Spring is baseball time. Boys like baseball. They _________ play baseball all day. _________ like baseball too. The _________ will not let them _________. They think baseball is _________ boys game.

The boys _________ their baseball mitts. They _________ a bat. Then they _________ a ball. The boys _________ three bases. Now, they _________ ready to play ball.

_________ batter is up. Then _________ pitcher throws the ball. _________ batter strikes three times. _________ is out. The next _________ is up. He strikes _________ times. The bat finally _________ the ball. He runs _________ first base. A player _________ the ball. The next _________ is up. He hits _________ ball very hard. It _________ over the fence. Crash! _________ ball hits Mrs. Smith's _________.

Mrs. Smith comes out. _________ is angry. The boys _________ they will pay for _________ window. Then she is _________ angry.

The game must _________. The boys have to _________. They must pay Mrs. _________. The boys run errands. _________ girls like to help. _________, they can pay Mrs. _________.

The boys are happy. _________ play ball again. They _________ the girls play too. _________ is up. He hits _________ the ball. This time he _________ not hit the ball _________. The ball lands in _________ grass. The game can go on.

UNDERSTANDING CONJUNCTIONS TEST

Directions: Read each sentence. Draw a line under the answer that tells the right meaning of the underlined word.

Example: The flower is red and yellow.
a. in addition
b. because
c. when
d. before

1. We will run and play.
a. but
b. besides
c. then
d. also

2. The girl laughed and laughed.
a. again
b. will laugh
c. as well as
d. but

3. One and one make two.
a. plus
b. but
c. when
d. again

4. We will eat and sing.
a. so
b. but
c. also
d. not sing

5. John cried, for he was sad.
a. because
b. else
c. either
d. with

6. It is neither big nor little.
a. except
b. not either
c. since
d. and

7. She went by, as I stood there
a. while
b. when
c. because
d. so

8. Ann laughed, for she was happy.
    a. then
    b. when
    c. and
    d. because

9. Neither John nor Mary is at home.
    a. no one
    b. either
    c. not either
    d. else

10. Adding two and two makes four.
    a. also
    b. will make
    c. plus
    d. with

11. The candy is good yet it is hard.
    a. also
    b. when
    c. still
    d. because

12. There was no place to go, but home.
    a. besides
    b. other than
    c. than
    d. however

13. The music was lovely while it lasted.
    a. since
    b. because
    c. when
    d. as long as

14. You may go or stay.
    a. and
    b. a choice
    c. then
    d. but

15. He laughed, but I did not.
    a. then
    b. yet
    c. so
    d. why

16. The dog is big and brown.
    a. is brown
    b. in addition
    c. because
    d. if

17. She will sleep and dream tonight.
    a. also
    b. because
    c. will dream
    d. again

18. The baby coughed and coughed.
    a. in addition
    b. then
    c. again
    d. will cough

19. Susan went, but I did not.
    a. because
    b. in addition
    c. yet
    d. when

20. Linda was so happy she could do nothing, but laugh.
    a. and
    b. however
    c. than
    d. except

21. This car is big as a truck.
    a. which is
    b. and
    c. so
    d. like

22. The dog will cover or hide the bone.
    a. the same as
    b. in addition
    c. so
    d. and

23. You may write with pen or pencil.
    a. other than
    b. then
    c. equally possible
    d. also

24. This house is taller than theirs.
    a. as tall as
    b. not as tall
    c. compare things not equal
    d. less than

25. Jane ran farther than Nancy.
    a. as far as
    b. far
    c. less than
    d. beyond.

26. She will stay home if it rains.
    a. although
    b. because
    c. on condition that
    d. when it

27. He walked slowly, so that he would not fall.
    a. because of
    b. therefore
    c. in order that
    d. so that

28. The day is sunny, though cold.
    a. because
    b. although
    c. and
    d. unless

29. The table was dusty, while mud was on the floor.
    a. at the same time
    b. therefore
    c. where
    d. as long as

30. She couldn't find out how to drive the car.
    a. in addition
    b. way in which
    c. when
    d. the reason for

31. I am so tired that I am unable to come.
    a. but
    b. and
    c. due to the fact
    d. for the purpose

32. She bought a red dress when a blue one would have been better.
    a. since
    b. though
    c. would be
    d. and

33. Jane lives where the weather is warm.
    a. due to the fact
    b. there
    c. when it is
    d. in a place

34. I don't know why she is going.
    a. due to the fact
    b. whether
    c. if
    d. for what reason

35. She stayed home because she was ill.
   a. for the reason that
   b. therefore
   c. when
   d. in that way

36. They will either come or call.
   a. because
   b. due to the fact
   c. a choice
   d. if

37. Now that you"re home, why not stay?
   a. because
   b. since
   c. when
   d. therefore

38. Since it is snowing, you might as well stay.
   a. because
   b. when
   c. therefore
   d. still

39. She ate her dinner and went home.
   a. also
   b. before
   c. but
   d. then

40. We opened the box, but we were careful not to make any noise.
   a. and
   b. however
   c. also
   d. when

41. The meat is good, yet it could be better.
   a. then
   b. while
   c. and
   d. still

42. We could not help, but hear the noise.
   a. however
   b. a choice
   c. which
   d. do other than

43. I wonder if Ann will go?
   a. will
   b. for
   c. when
   d. whether

44. While I like the cake, it is dry.
a. because
b. although
c. when
d. since

45 She is coming home, though not to stay.
a. then
b. while
c. however
d. and will

46. The world was different, when I was younger.
a. since
b. then
c. because
d. while

47. He moved to Florida, where it is warm.
a. because
b. due to the fact
c. after that
d. at which place

48. Be careful how you walk.
a. how it is done
b. way in which
c. while
d. when

49. Why did you go when you were tired?
a. in spite of it
b. while
c. then
d. since

50. I am happy because you came.
a. the cause of
b. when
c. while
d. for the reason that

51. Tell me how this happened.
a. when
b. in what way
c. why
d. how it

52. He is neither good nor bad.
a. not so
b. therefore
c. not either
d. either

53. You must *either* be quiet or go home.
- a. neither
- b. so
- c. a choice
- d. also

54. She agreed, *so* they went ahead with the plans.
- a. but
- b. for that reason
- c. and so
- d. in addition

55. She was nice *and* pretty.
- a. but
- b. as well as
- c. again
- d. was pretty

56. I have no pleasure, *but* reading.
- a. when
- b. other than
- c. before
- d. yet

57. I can do nothing, *but* with your help.
- a. because
- b. other than
- c. if
- d. unless

58. *While* we love the boy, he is bad.
- a. when
- b. due to the fact
- c. because
- d. at the same time

59. We had just eaten *when* the bell rang.
- a. then
- b. after which
- c. at the time
- d. as

60. We must stop *since* it is raining.
- a. but
- b. though
- c. when
- d. because

61. It stopped raining, *so* we went home.
- a. then
- b. but
- c. for that reason
- d. also

62. I went to the mountains, where it is cold.
    a. because
    b. at which place
    c. when
    d. due to the fact

63. The baby was happy, while she was here.
    a. because
    b. although
    c. when
    d. during the time that